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THE RAILWAY GAZETTE

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TRANSPORTATION

BRITISH RAILWAYS

The illustration shows the first of the Type 1, 1,000 h.p. mixed-traffic diesel-electric locomotives built by The English Electric Co. Ltd. in conjunction with its associates The Vulcan Foundry Limited. Twenty of these locomotives have been built and are intended for operation on freight transfer duty on the London Midland Region.

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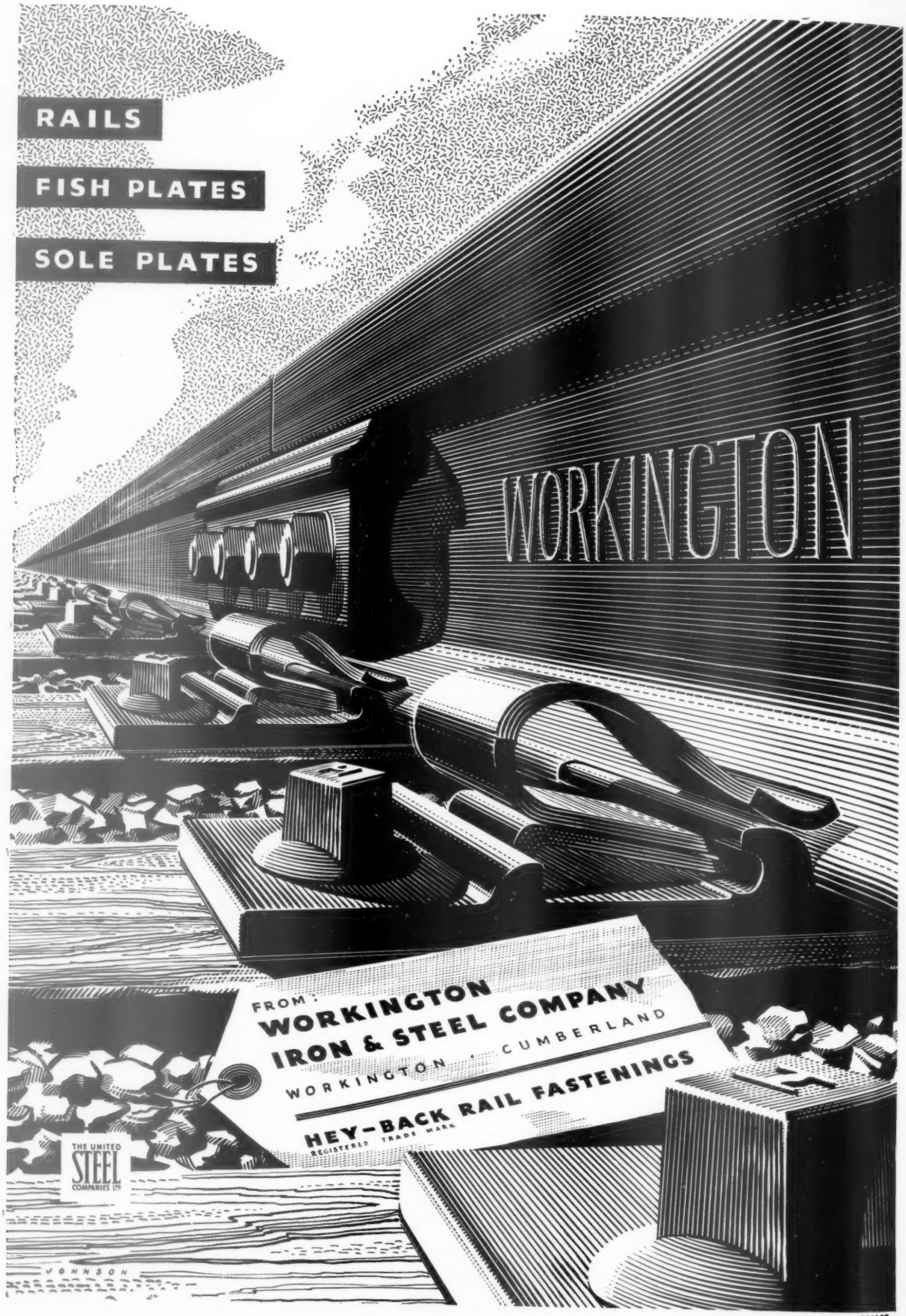
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CONTENTS

	PAGE
Editorial Notes	641
Institute of Transport Congress in Dublin	643
Serious Situation on U.S.A. Railways	644
East African Railways & Harbours in 1957	644
British Transport Commission Statistics	645
Netherlands Railways	645
Letters to the Editor	646
The Scrap Heap	647
Overseas Railway Affairs	648
Changeover to Diesel Traction in Ireland	649
The Organisation of Transport	651
Brunel Papers	652
New Goods Depot at Peterborough	653
Electric Traction Section	655
Personal	661
New Equipment and Processes	664
News Articles	666
Contracts and Tenders	669
Notes and News	670
Railway Stock Market and Official Notices	672

Agreement to Differ

THIS week we publish a letter from Mr. W. J. P. Webber, General Secretary of the Transport Salaried Staffs' Association. He takes exception to our editorial statement of May 23, that "there has been acceptance on both sides that the basic factor" (in the recent railway pay dispute) "was the ability of the industry to pay." He quotes examples of his official statements to the British Transport Commission and claims that these constitute proof that neither he nor his union ever has been prepared to accept the necessity of existence of adequate funds to meet pay increases. He refers to his view that the railways, like other nationalised industries, should receive a Government subsidy if an invidious exception is not to be made. Mr. Webber is confusing acceptance with dislike. In our May 16 issue we published a statement issued by the Commission summarising the progress of negotiations with the three railway unions. In this, the Commission made abundantly clear its position and the conditions under which it was prepared to grant an increase. The text of a letter from the Minister of Transport & Civil Aviation, Mr. Harold Watkinson, to the Chairman of the Commission, Sir Brian Robertson, was published in the same issue. The letter stated that "there can be no question of the Government's giving a subsidy to meet the cost of increases in railwaymen's pay. The extent and timing of any increase must therefore depend on the view the Commission takes of its ability to pay having regard to the improvement in its financial position that will result from the measures which have now been decided upon in the discussions between the Government, the Commission and the unions." The 3 per cent increase was offered and accepted after publication of this letter, and after the Commission had clarified its position. The offer was made on the firm condition that the money to meet it was to be found as a result of economies and not from any outside source. In accepting, while the unions maintained their dislike of the principle involved, they accepted the necessary application in this instance.

Backs to the Wall

WHILE Mr. Frank Cousins, the irresistible force, continues to batter against Sir John Elliot, the immovable object, dissatisfaction with the progress of the bus strike, now in its fifth week, becomes increasingly apparent among rank-and-file busmen. This is accompanied by an unwillingness of the general body of the Transport & General Workers' Union to broaden the conflict. Neither has the General Council of the T.U.C. shown itself unduly sympathetic to Mr. Cousins. Monday's unsuccessful appeal to the Minister of Labour & National Service, Mr. Iain Macleod, to mediate between the union and London Transport had to be followed by a meeting with the Prime Minister before negotiations were finally resumed, but even then results were negative. London Transport reiterated its offers made in accordance with the settlement suggestions of the Prime Minister: an increase of 8s. 6d. a week to central road services operating staff, an additional agreed payment for drivers of single-deck Green Line coaches, and agreement of a date for wage review of "excluded staff." When these proposals failed, the L.T.E. offered to refer back the pay question for "excluded staff" to Sir John Forster, Chairman of the Industrial Court, but this offer also was not accepted.

A Note of Finality

L.T.E. claims that all these proposals represent substantial improvements on the position which obtained before commencement of the strike and that they form a fair and reasonable basis for settlement. Whether or not the busmen agree, it is extremely unlikely on present signs that any additional offers will be made. A new note of finality has entered managerial handling of industrial disputes, engendered by the very real financial difficulties in which employers today find themselves. It is no longer simply a question of how much and when. Barrels are being scraped everywhere and it is now becoming obvious to both sides that a halt in the spiral is necessary for survival itself. A significant change in the public attitude of at least one union was expressed on Monday by Mr. Jack Cooper, chairman of the annual conference of the General & Municipal Workers; further reference to his speech is made on another page. In stating that "it is better to have moderate wage increases under a stable price level than excessive increases that are swallowed up by rising prices," Mr. Cooper gave unexpected support to the Government's view that wage restraint is necessary for economic salvation.

F.I.D.I.C. Meeting

AT the annual general assembly of the Fédération Internationale des Ingénieurs-Conseils (International Federation of Consulting Engineers), held in Oslo on May 29-31, delegates from Belgium, Denmark, Finland, France, Western Germany, Great Britain, Holland, Norway, Sweden and Switzerland, met under their President, Mr. Julian S. Tritton. The discussions, of particular

interest to manufacturers and contractors, included international conditions of contract for civil engineering work, arbitration provisions under the rules of the International Chamber of Commerce, and the relations of the Federation with the World Bank. During the coming year the Executive Committee of the Federation will draft new international contract conditions for the supply of plant and machinery, and a model form of agreement between client and consulting engineer. Over many years consulting engineers have played a leading part in the survey and construction of new railways in underdeveloped countries. Some concern is felt by consulting engineers that more use is not made of their extensive knowledge of civil and mechanical engineering by national railway authorities. At the outset of the British Railways modernisation programme, the Association of Consulting Engineers put at the disposal of the British Transport Commission their available capacity for design work.

Faster Travel Between Sydney and Melbourne

ONE good result of the conversion from 5 ft. 3 in. to 4 ft. 8½ in. gauge of the Victorian Railways line from Albury, on the New South Wales border, to Melbourne will be shorter journey times. The New South Wales Minister of Transport, Mr. A. G. Enticknap, stated recently that it was hoped that the fastest passenger train time between the two capitals would be 13 hr. after the gauge alteration, compared with 15½ hr. at present. The through trains will be diesel hauled throughout, and no doubt an increase in motive power will go far to make possible the schedule envisaged, for abolition alone of the existing transhipment at Albury will not make all that difference. As the line is single most of the way, a 13-hr. timing for the 590 miles will require some very smart running and skilful operation. Such a journey overnight, without a change, should bring back much traffic to the railways and create a new travel demand.

Overseas Railway Traffics

OPERATING revenues of the Canadian National Railways for the month of March, 1958, amounted to $55,784,000. Expenses, taxes, and rents totalled $59,898,000 resulting in a net operating income deficiency of $4,114,000. In March, 1957, operating revenues were $65,479,000; expenses, taxes, and rents were $64,659,000 and net operating income was $820,000. The aggregate net operating income to March 31 showed a deficiency of $15,435,000 compared with a profit of $5,436,000 for the corresponding period of 1956. Canadian Pacific Railway revenues for April, 1958, were $39,104,239 (against $43,072,350 for April, 1957) and railway expenses $36,477,819 ($39,987,030), so that net earnings were $2,626,420 ($3,085,320). Aggregate net earnings from January 1 were $8,701,045 ($5,548,510). Railway operating revenues of the International Railways of Central America for April amounted to $1,386,572, a decrease of $157,493 compared with April, 1957. The aggregate net revenue from railway operations for the period January 1 to April 30 was $542,559 ($1,375,128). Gross traffic receipts of the Peruvian Corporation Limited for the 10 months to April 30 amounted to $8,778,133 against $10,368,549 in the corresponding period of 1956-57.

New Standard-Gauge System in Venezuela

AN entirely new standard-gauge railway system is being created in Venezuela, after the closing of various narrow-gauge lines. In the last quarter of the 19th century private companies, some of them British, built 14 narrow-gauge railways with a total length of about 620 miles, mostly serving local interests and running inland from the coast. In course of time some of them ceased operation. Six were taken over by the Government. Subsequently, mainly because they had ceased to pay, largely because of the development of road and air transport, several of the remaining lines were closed. Today the only railway in operation is the 3-ft. 6-in. gauge Caracas-Valencia Railway, 111 miles long. In 1950 the Government approved the National Railway Plan, providing for construction of an extensive 4-ft. 8½-in. gauge system, over a period of 20 years, divided into two 10-year phases; during the first phase 1,515 miles of main line are to be built, and 1,125 miles of branch line during the second. Construction was begun in 1954 on the Puerto Cabello-Barquisimeto line (109 miles), to be opened next July. In 1956 work began on a line from the port of Guanta to Naricual (17 miles) to serve existing coal mines; this railway, which in the future will form part of a line from Guanta to Ciudad Bolivar, will be completed by the end of 1958. Apparently diesel traction is envisaged on all lines.

Sidelights on Brunel

THE centenaries approach of the completion in April, 1859, of the Royal Albert Bridge at Saltash and in May of that year of opening the Cornwall Railway from Plymouth over the Royal Albert Bridge to Truro; these completed the railway connection, later to be wholly part of the Great Western Railway system, from Paddington to Penzance and crowned the achievement of Isambard Kingdom Brunel; but he died soon afterwards worn out by hard work. The Curator of Historical Relics of the British Transport Commission has published some original documents which relate to construction of the Royal Albert Bridge under the direction of Brunel. Extracts from these are given on another page. They illustrate the character of the creator of the G.W.R. His exhortations to waste no time in getting on with the job, and to be tactful and courteous to those outside the railway with whom one deals are as apposite now as they were 100 years ago. As the Royal Albert Bridge endures today and indeed bears much heavier loads than were dreamed of in 1858, so does the tradition of energy, industry, determination and skill bequeathed by Brunel.

London Transport Weather Recording

THE opening of a further two unmanned weather-recording installations by London Transport this year will provide information on the effect of the weather on rail temperatures at three sites spread across the northern limits of the London Underground system. The existing installation is at Queensbury on the Stanmore branch of the Bakerloo line. The two new stations will be at Theydon Bois on the Central line and Chorley Wood on the Metropolitan. They form part of a research programme aimed at improving the use of conductor rail de-icing facilities. The installations were set up originally to provide data to assist the Meteorological Office with its special forecasts of icing risk for conductor rails; these forecasts enabled a decision to be made on whether to bring railway de-icing equipment into use. From the data the Meteorological Office was able to make an estimate of rail temperatures from the normal forecast at air temperature at 4 ft. above ground level. The improved accuracy with which rail temperatures can now be predicted has enabled the probability of icing conditions to be estimated more reliably than was possible previously, permitting more economical use of de-icing facilities.

Maintaining Braked Wagons

ONE of the signs of the increase in the number of vacuum-braked wagons on British Railways is the construction at Chester, London Midland Region, of the first new wagon shop equipped with special facilities for maintaining vacuum brakes. Some details are given elsewhere in this issue. All except heavy repairs will be possible in the new shop, which is expected to carry out weekly 92 light repairs and steel wagon repairs, 25 brake overhauls only; also re-conditioning of 250 brake cylinders and associated equipment will be undertaken for the wagons in the shops and for other wagon shops in the Region. These are not big numbers; one would have thought that a plant with greater capacity would have been more economic, though the number of vacuum-braked

wagons needing maintenance in the area may not necessitate anything larger at present. According to our information, there is nothing particularly novel in equipment or layout.

More Fully Braked Goods Trains

THE running at express speeds of fully-braked goods trains makes possible not only quicker transits for wagons, but also acceleration of other trains on the line. The growth in the number of such trains in the North Eastern Region was stressed last week by Mr. F. C. Margetts, Assistant General Manager (Traffic) of the Region. He pointed out that 485 fully-braked trains were now originating in the North Eastern Region, 86 more than a year ago; partially braked freight trains running at semi-express speeds now numbered 626, 44 more than at this time last year. This is all to the good insofar as timings are cut between large depots or yards; but satisfactory service depends on the expedition with which the wagon and its load are treated from placing for loading throughout the whole transport operation to handing over to the customer.

Gauge-widening in Australia

PROBLEMS of gauge-conversion are particularly numerous and important in Australia. There they are of two kinds: (1) reduction of gauge from 5 ft. 3 in. to 4 ft. 8½ in., now approved as the new standard for that country, and (2) widening from 3 ft. 6 in. to 4 ft. 8½ in. (or 5 ft. 3 in. in South Australia). In 1956, the cost of (1) was £A3,000 a mile, whereas (2) cost £A25,000 a mile. The latter requires a maximum of mechanisation. A method approved by a Royal Commission in 1921 entailed heavy labour costs, but a more recent one is largely mechanised. Initially, the 3 ft. 6 in. gauge joint sleepers are replaced by 8-ft. (4-ft. 8½-in. gauge). In a 12-sleeper rail-length the 2nd, 4th, 6th, 7th, 9th and 11th existing 3-ft. 6-in. gauge sleepers are then mechanically sawn in half, and the 3rd, 5th, 8th, and 10th are left intact but unspiked. The rails are next slewed apart to 4-ft. 8½-in. gauge with the half sleepers still spiked to them. After sleepers 3, 5, 8, and 10 and the joint sleepers have been respiked to suit the wider gauge, tie-rods are coach-screwed or bolted so as to connect the halves of the sawn sleepers. A German diesel-electric Trackshifter, designed to run on two different gauges and with duplex slewing gear, can be used for the widening. Some disturbance of the roadbed is unavoidable, but as the half sleepers have to be moved only 7¼ in. laterally, little "propping" is necessary.

The Largest Steam Locomotives

NOW that construction of steam locomotives has ceased for many railways—though it is by no means over yet—one can consider the size to which the steam locomotive attained from the 4½ tons of the *Rocket*. From 1904, there was no denying the American claims to have constantly the largest locomotive in the world; even the gradual advance in the size of the Beyer-Garratts never came within threatening distance of the U.S.A. Mallets from the first 0-6-6-0 on the Baltimore & Ohio in 1904 down to the Union Pacific "Big Boy" class of 1941. As no danger now exists even, we believe, in the U.S.S.R., that some one will build a bigger steam locomotive than has gone before; it is safe to quote records as records. The biggest steam locomotives ever were the "Big Boy" 4-8-8-4 Mallets weighing 762,000 lb. for the engine, plus 434,000 lb. for the fully laden tender, a total of 1,196,000 lb., or 534¼ tons. Running this close were the Chesapeake & Ohio 2-6-6-6 Mallets, built by Lima in 1948, which weighed 751,850 lb., plus 428,350 lb. for the fully-laden tender, a combined total of 1,180,200 lb., or 527¼ tons. Third came the earlier Northern Pacific 2-8-8-4 "Yellowstone" class, 716,000 lb. for the locomotive and 400,000 lb. for the tender, or 499 tons all told; but this class still holds the record for the largest grate area—182 sq. ft.

More Diesels for the Illinois Central

DESPITE the downward trend of its traffic, the Illinois Central Railroad, determined to maintain its reputation as a well-equipped railway, is buying 70 more diesel-electric locomotives. This is in contrast to some U.S.A. railways which have reacted to a drop in receipts by drastic cancellation of orders for motive power. In a message to key members of the staff, Mr. Wayne A. Johnston, President of the railway, states that "for a railroad to remain strong and in a position to give its customers the best of service, it must continue to buy the tools necessary for the task." The new locomotives will be 1,750-h.p. GP-9 units similar to others bought in recent years. They are suitable, either used singly or in multiple-unit, for shunting or line freight duties, and can be used for passenger work if heating boilers are fitted. With the 70 new units, the Illinois Central will have 376 general-purpose diesels, 48 of 1,500 h.p. and 328 of 1,750 h.p. It has 42 passenger units in the 2,000-2,400-h.p. range and 169 diesel shunting locomotives of 600-1,200 h.p. As a reserve in case of sudden demands for motive power, the system has 342 steam locomotives, half of which are available for immediate service. It has two main types of diesel, the traction motors and gear ratios of which are interchangeable. The bogies of the general-purpose units can be interchanged freely, as can those of the shunting units. This has led to considerable savings by reducing stocks of spare parts.

Institute of Transport Congress in Dublin

THE considerable extent to which Coras Iompair Eireann has adopted diesel traction for both passenger and goods haulage on its railways makes Dublin particularly suitable as the venue of the Institute of Transport Congress held there this week. Diesel traction has been the main feature. The programme for Wednesday included a comprehensive and informative paper by Mr. T. C. Courtney, Chairman of C.I.E., outlining what has been and is being done by his company in the introduction and use of diesel motive power, and the remarkable economies achieved. An abstract is given on page 649.

Delegates have had the opportunity of visiting the C.I.E. Inchicore Works, with their diesel locomotive and railcar repair facilities, a model of their kind, recently installed under the direction of Mr. O. V. S. Bulleid, Chief Mechanical Engineer of C.I.E. Another feature of interest is carriage and wagon production, and more especially that of passenger stock of lightweight laminated wood construction. The experimental turf-burning locomotive is another characteristically bold design by Mr. Bulleid which many visitors to Inchicore have inspected. In addition, practical—and no doubt pleasurable—experience of diesel travel is being gained by those delegates who today travel to Killarney and back by diesel radio train, a popular amenity of travel developed by C.I.E. The general impression left on those attending the Congress is certain to be one of the vigour and efficiency with which the railways in the Republic of Ireland, both C.I.E. and the Great Northern, are serving the community in the face of great difficulties; the latter include absence of large industrial centres, of extensive industrial plants, and, apart from Dublin, of great population centres to engender traffic; relatively short hauls because of geographical limitations; and intensive road competition.

The organisation of transport, or rather, the pros and cons of measures by the State to co-ordinate and to harmonise the several means of transport for the best advantage of the greatest number, is the theme of yesterday's paper to the Congress by Sir Brian Robertson, Chairman of the British Transport Commission. "Co-ordination" when applied to transport is a word liable to be misunderstood unless studied in its context. It is clear what the author of this paper has in mind. The subject is so complex as to be very hard to deal with in one paper, but Sir Brian Robertson has expounded his ideas with clarity. His paper is summarised very briefly on another page. Space allows mention only of some of the many points which arise, such as the measures to

regulate transport taken since 1948 by the Government of Western Germany, whose policy has been one of deliberate *laisser-faire*, and in the U.S.A., where opposition to regulation of this kind is traditional—though many people will be surprised at the amount of restrictions under which the railways have to operate.

Two statements made by Sir Brian Robertson will go far to answer questions that many have long been asking. First, he admits that the railway passenger and provincial omnibus services of the British Transport Commission are "not as well co-ordinated as they should be." He does not indicate what further steps are planned in this direction. At the moment there are reports of new railway diesel train services capturing traffic from buses in the areas concerned. Until relatively recently, this did not very much matter, because there was plenty of passenger traffic for the buses and for the railways—when the latter could provide attractive services. Now, however, with the shrinkage in demand for public passenger transport, the adverse situation of some bus undertakings may necessitate some action to co-ordinate traffic.

The second important reference by the Chairman of the British Transport Commission is that to the functions of the Area Boards. It has often been asked why they are so called, as they seem to have confined themselves hitherto to management of the Regions of British Railways, despite the provision in the Act of 1954 as to their concerning themselves with other nationalised transport activities. Sir Brian Robertson shows that they have in fact so concerned themselves before now, and the Commission hopes to work towards a position in which the name Area Transport Boards would be appropriate.

It is encouraging to hear that steps are being taken to eliminate such redundant activities as separate collection and delivery services of parcels and "smalls" by both British Railways and British Road Services.

Serious Situation of U.S.A. Railroads

THE keenness of the competition for goods traffic faced by railways in the U.S.A., not only with road but also with air transport, is shown in the air freight advertisement in a recent issue of the *Chicago Tribune*, reproduced on page 647; it was sent us by a correspondent. The situation as revealed by the Association of American Railroads at the beginning of April was reviewed in our editorial article last week. Figures released by the Interstate Commerce Commission show that staff reductions have been drastic. In the middle of April the staffs of the Class I railways are reported to have totalled some 829,000, a drop of 163,000, or 16 per cent, from the total at the same period of 1957, and 12,000 fewer than were employed during last March. Railway employment today in the U.S.A., where the total route mileage open last year was some 220,000, is believed to be at its lowest since 1897.

The problem was discussed in an informative article by a correspondent in *The Financial Times* of May 22. One of the most important reasons for the severity of the railway slump, he points out, is that the amount of railway goods traffic has fallen at an even faster rate than total national production. While output is now down by nearly 14 per cent from its peak at the end of 1956, railway freights have fallen by over 25 per cent in a year. Mention is made of the growth of competition from oil pipelines though inland water transport, apart from that on the Great Lakes, appears to have increased in importance. The recession and inflation have been particularly unkind to the railway corporations whose costs have been raised by higher wages, but who are prevented from adjusting their rates, not only by the weakness of the market, but also by the network of Federal and State restrictions.

This does not mean, however, that many people in positions of authority in the Government and industry, and not only the boards and senior staff of the railway companies, are not aware of the fundamental reasons for the predicament of the railways, and of the importance of an efficient railway system to the nation. Much remedial legislation is now under consideration.

East African Railways & Harbours in 1957

THE report upon the East African Railways & Harbours administration for the calendar year 1957—a copy of which we have received from Mr. J. R. Farquharson, General Manager—states that for the second consecutive year there was little change in the volume of traffic moved by the railways. That in Kenya and Uganda increased, but the Tanganyika traffic decreased as also did the Harbours' volume of cargo handled. Road traffic decreased appreciably, and lake marine traffic was heavier on Lake Victoria but lighter on the other lakes. The continued closing of the Suez Canal diverted Belgian Congo and Ruanda Urundi transit traffic through West instead of East African ports, and, even after its reopening, imports to Belgian territories were slow to revert to the Tanganyika route. That the aggregate volume of goods traffic should have been maintained in spite of these setbacks was satisfactory. Passenger traffic continued to increase.

The combined revenue from railways and harbours totalled £22,358,000, £712,000 more than in 1956 thanks largely to higher cargo-handling charges and railway rates coming into force. On the other hand, expenditure on working rose by £594.000 to £17,543,000—due mainly to higher staff costs totalling some £380,000—and contributions to the Renewals Fund increased by £120,000 to £2,225,000. The credit balance to net revenue account was therefore £2,590,000, virtually the same as for 1956 and giving a return 2·7 per cent on total capital expenditure. However, even with credits from miscellaneous transactions, the railway net earnings failed to meet interest and capital redemption charges, a deficit of £369,000 being carried to the Appropriation Account. Net earnings of harbours were able to contribute £50,000 to the Harbours Betterment Fund, and still have a small balance of £39,000 to be carried to the Appropriation Account. The £369,000 railway deficit was charged to the Rates Stabilisation and Relief Fund. The net expenditure on new equipment, new works and renewals during the year was £7,000,000, £8,250,000 less than the 1956 figure. Total capital expenditure at the end of 1957 stood at £97,500,000. A long-term loan of £8,500,000 was raised on the London Market during the year, issued at par and carrying 5¾ per cent interest.

Some of the principal results for 1956 and 1957 were:—

	1956	1957
	Thousands	
Railways, steamers & motor transport—		
Total train-mileage	9,701	9,292
Passenger journeys	5,828	6,450
Goods tonnage	3,881	3,807
	£ thousands	
Coaching receipts	1,964	2,067
Goods receipts	13,446	13,814
Total receipts	17,279	17,742
Working expenses	13,649	14,027
Harbours—		
Receipts	4,367	4,616
Expenditure	3,547	3,820

One of the most serious problems facing the railways was increasing road competition. It was estimated that the annual losses of tonnage and revenue by diversion of legitimate rail traffic to the roads were 400,000 tons and £600,000 respectively.

Reviewing the progress achieved since the formation of the East African Railways & Harbours administration in 1948, by the amalgamation of the Kenya & Uganda Railways & Harbours and the Tanganyika Railways & Port Services, the following developments were noted. Public goods carried by inland transport services had increased from 2,600,000 to 3,800,000 tons and ton-mileages from 769,000,000 to 1,454,000,000. Annual exports handled at the ports had risen from 3,100,000 to 4,400,000 tons. The number of locomotives had increased from 234 to 461 and wagons from 5,764 to 9,594, whilst the construction of new lines had increased the route-mileage from 2,930 to 3,375. Port developments had also been on a similar scale. In this, its first full year in operation, the Western Uganda Extension carried 91,000 tons of goods.

During 1957 no new steam locomotives were placed in service but six were withdrawn. Ten "85" class diesel-hydraulic locomotives were placed in traffic, as well as two

inspection coaches, 31 new tank and 14 covered goods wagons; also 20 goods wagons were converted to insulated vans and three coaches into buffet cars. Overall punctuality for passenger trains improved by 5·84 per cent.

At Mombasa, good progress was made on the reconstruction of Berth No. 10, soon to be completed. At Kipevu deep-water berths and quays, 2,400 ft. long, nearly 2,000,000 cu. ft. of earth were excavated and deposited for reclamation.

British Transport Commission Traffic Receipts

BRITISH RAILWAYS merchandise and livestock traffic continued during Period 5 to show a decrease compared with the same period of last year, as did mineral traffic and C. & D. services. Merchandise receipts were £461,000 down on the 1957 figure, which is at least better than for Period 4, when they were £1,155,000 down. Coal class traffics exceeded last year's total by a considerable margin, £1,071,000; it is impossible to say how far this indicates activity in coal production or altered trends in despatches by the National Coal Board.

The total freight receipts of British Railways for Period 5 at £26,494,000 only barely exceed the 1957 total for these four weeks. The aggregate railway freight receipts for the first 20 weeks of the current year are less by £7,073,000 than the corresponding figure last year. This is not encouraging. It is probably the result of a number of factors, including reduced industrial activity; the decline in mineral traffics may be an indication of this, though the possibility of shorter hauls must be borne in mind. It will be interesting to see the Regional figures for Period 5, with the details of tonnages, which will be published in four week's time. The totals of receipts afford no indication of what has been achieved by the railway traffic staffs.

—	Four weeks to May 18		Incr. or decr.	Aggregate for 20 weeks		Incr. or decr.
	1958	1957		1958	1957	
	£000	£000		£000	£000	
Passengers—						
British Railways ..	9,553	9,856	− 303	45,145	47,986	− 2,841
London Transport:						
Railways	2,017	1,760	+ 257	9,153	9,180	− 27
Road services ..	2,329	4,549	− 2,220	19,863	23,066	− 3,203
Provincial & Scottish buses	4,398	4,403	− 5	20,756	21,572	− 816
Ships	361	433	− 72	1,457	1,398	+ 59
Total passengers ..	18,658	21,001	− 2,343	96,374	103,202	− 6,828
Freight, Parcels & Mails—						
British Railways:						
Merchandise & livestock	7,638	8,099	− 461	37,725	44,588	− 6,863
Minerals	3,660	4,119	− 459	19,359	21,205	− 1,846
Coal & coke ..	10,153	9,082	+ 1,071	52,456	50,850	+ 1,606
Parcels, etc., by passenger train ..	4,074	3,821	+ 253	19,716	19,210	+ 506
Collection & delivery, etc. ..	969	1,018	− 49	4,821	5,297	− 476
Total freight, British Railways	26,494	26,139	+ 355	134,077	141,150	− 7,073
Others*	4,279	4,195	+ 84	20,724	20,939	− 215
Total Freight, Parcels & Mails	30,773	30,334	+ 439	154,801	162,089	− 7,288
Total	49,431	51,335	− 1,904	251,175	265,291	−14,016

* Inland waterways, freight, road haulage and ships

The effect of the London bus strike, which began halfway through the period, is seen in the drop to £2,329,000, compared with £4,549,000 last year, in London Transport bus receipts. On the other hand Underground receipts at £2,017,000 exceed last year's total for the four weeks by only £257,000; this is surprising, as many more people were thought to have been travelling by Underground as an alternative to the bus. The slight drop in British Railways passenger receipts indicates little. It is unlikely that the greater numbers reported to have been travelling by London suburban trains instead of buses, would have made an appreciable difference to receipts in the light of other factors affecting travel, such as weather. There is no obvious reason for the marked drop in ships' passenger receipts; the French political crisis began late in the period, during which very few people were reported to have changed their plans for travel to the Continent.

PERCENTAGE VARIATION 1958 COMPARED WITH 1957

	Four weeks to May 18	20 weeks to May 18
British Railways—		
Passengers	− 3·0	− 5·9
Parcels	+ 6·6	+ 2·6
Merchandise & livestock	− 5·6	− 15·3
Minerals	− 11·1	− 8·7
Coal & coke	+ 11·7	+ 3·1
C. & D. services	− 4·8	− 8·9
Total	+ 0·1	− 5·2
Ships (passengers)	− 16·6	+ 4·2
British Road Services, Inland Waterways & Ships (cargo)	+ 2·0	− 1·0
Road Passenger Transport, Provincial & Scottish	− 0·1	− 3·7
London Transport—		
Railways	+ 14·6	− 0·2
Road services	− 48·8	− 13·8
Total	− 31·1	− 10·0
Aggregate	− 3·7	− 5·3

Netherlands Railways

SOME reduction in economic activity and restriction in investment last year affected operation of the Netherlands Railways. Much progress nevertheless was made under the presidency of Dr. F. Q. den Hollander. For the first time since 1950 no increase in passengers was recorded; the total passenger-miles also remained at about the level of the previous year. Freight traffic is expected to show a drop of 5 per cent, attributable largely to reduced home production and to reduced imports of coal; other freight traffic remained fairly steady. As a result of the increased rates and fares introduced on April 1, 1957, passenger receipts increased by about 5 per cent and freight by about 2 per cent. Against this, operating costs rose again, while increased depreciation and interest charges had to be met.

The year saw the introduction of the "Trans-Europe Expresses" (T.E.E.), in introducing which the Netherlands Railways have taken a leading part. Electrification was completed between Breda, Roosendaal, and Flushing; Tilburg 'sHertogenbosch, and Nijmegen and Roosendaal and the Belgian frontiers; of the total route mileage of some 2,000 about 980 now are electrically worked. Many important engineering works were completed, notably the Velsen tunnel, under the North Sea Canal, described in our issue of January 10, 1958. Thirty-seven flashing light level crossing installations were put into service, also 21 half-barrier equipments, 17 of which are fully automatic. Conditions at manned crossings also were improved. These improvements went far to solve a serious road and rail traffic problem in Holland, where, for topographical reasons level crossings abound. Automatic colour-light signalling was extended over several routes and at the close of the year covered over 370 route-miles. Many stations were rebuilt or improved; Rotterdam Central and Oldenzaal are notable examples.

The diesel-electric locomotive fleet increased by 72 units to 440; 107 steam locomotives were scrapped. By the end of the year 67 per cent of train mileage was being operated electrically and 31 per cent by diesel traction. Receipt of new passenger rolling stock at a greater rate than the scrapping of old increased the number of seats available from 106,191 to 112,318 as at December 31. Much new freight stock also was received, including 677 closed and 1,090 open wagons, which, with losses by scrapping, gave 22,496 at December 31. Amongst new passenger stock placed in service were 140 vehicles, certain of which were in the form of train sets, including some for the T.E.E. diesel and for the Belgo-Dutch dual voltage through services; the latter were the subject of an illustrated article in our issue of May 10, 1957.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Motive Power Economics

May 27

SIR,—There is no doubt about the ability of your correspondent Mr. R. Bell to produce figures to prove anything he sets out to prove. Whether American statistics are of any more than propaganda value is debatable. In his letter published in your issue of April 11, Mr. Bell states: "A percentage of 11 electric locomotives [on U.S.A. Class 1 railways] out of service for repairs is excessive and does not support the claim sometimes made that the electric locomotive is a stouter machine than the diesel."

A diesel-electric locomotive is simply an ordinary electric job stripped of its current collecting gear and with a complicated generator substituted—an addition hardly conducive to increased "stoutness" except in the more usual modern sense of the word. But the importance of such statements lies in the fact that they will be believed wholeheartedly by the women shareholders of the U.S.A. railways, which appear to afford the biggest and least critical market for the diesel.

Yours faithfully,
L. IRVINE-BROWN

P.O. Box 711, Singapore

Railway Wages

May 29

SIR,—The editorial article headed "Joint Enterprise" on page 587 of your May 23 issue contains the statement: "The whole atmosphere in which the agreement was negotiated has been very different from that governing similar wage talks in the past. With the acceptance on both sides that the basic factor was the ability of the industry to pay, everything depended on the willingness of the Commission to consider the principle of higher wages and the union's co-operation in measures to make such increase possible." Lest there should be any misunderstanding on the point, I should like to make it quite clear that this Association has not entered into any agreement or understanding involving a departure from its policy that the payment of adequate salaries should not be dependent upon the financial position of the railways.

In my submission to the Railway Staff National Tribunal in March I stated:—"The Commission have referred to the increased costs of other commodities, costs which they have no option but to pay. Our members, who also have the increased costs to bear, cannot understand why the staff should be singled out and denied the maintenance of their standards on the ground of increased cost. . . ." Then, in reply to the B.T.C. advocate's submission, I said:—

"He made the point that the Commission wished to work without a subsidy. Meantime he is asking, in effect, that the subsidy to balance the Commission's accounts shall be provided by the workers in the industry.

"On this question it is fair to point out that railways throughout the world are in a difficult position, most losing money, because of the same difficulties of competition which are experienced by British Railways—and the Government and the country generally will have to face up to the fact that if they want a railway system they must pay for it in one way or another.

"On the question of productivity, I referred to the reduction in railway business as a deliberate result of Government policy, and that is an additional reason why the question of a subsidy to this vitally essential national industry should be carefully reconsidered, and it should be noted that the decision to try to make the industry an economic proposition, irrespective of the effect on the wages and salaries of the workers therein, was not a decision to the trade unions but of the management.

"We feel that the obligations placed upon the railways to provide an adequate and economical service may be a contradiction in terms. An economical service can be provided if all unremunerative lines are closed, together with expensive cross-country hauls, but that would not provide an adequate service, and if both obligations are to be assumed by the Commission, then I again repeat it is the Government and the nation that must face the problem. That may involve a subsidy, and that is a question that should be squarely faced. Subsidies are now provided for other industries which are regarded as essential to the nation—not at the expense of the workers in the industry. And we cannot see why we should be singled out for this special treatment."

During the negotiations following the publication of the Tribunal's findings, my Association has never departed from the principle referred to above: indeed, it has continued to stress that principle.

It is true that the B.T.C. has agreed to grant a 3 per cent increase because it has been able to satisfy the Government that it will be able to effect certain economies, but that does not mean that the Association has accepted the principle that an increase in salaries must be dependent upon the effecting of economies. In saying that, however, I would like to recall that the Association has *always* given its full co-operation in any proposals for more economical and more efficient working (and the Commission has freely acknowledged this on more than one occasion).

Yours faithfully,
W. J. P. WEBBER
General Secretary

Transport Salaried Staffs' Association,
25, Euston Road, London, N.W.1

Commercial Development of Scenic Travel

April 23

SIR,—Now that further economies are envisaged on British Railways, I urge that the commercial possibilities of the scenic attractions of many lines in Britain be realised to the full. Diesel railcars are largely responsible for what is, to many people, a discovery. Here is a means of increasing revenue and of avoiding complete closure of some lines.

Certain sections seem already established as holiday lines and point the way, such as the Vale of Clwyd and Llanberis branches in Wales, the Lakeside line to Windermere, and the Grassington branch in Yorkshire. The Coniston branch could be used thus after cessation of the regular service and the track would still be there for use in bad weather when the road is impassable. On a larger scale the Leeds-Skipton-Carlisle and West Higland lines have a tourist potential not fully realised.

No line of scenic pretensions should be closed on orthodox economic grounds without its possibilities from this point of view being examined. A train, and especially a diesel railcar, has advantages for a day's joy riding that nothing can rival, with a special appeal to road-weary motorists. A committee should be appointed without delay to organise an approach to the public.

Yours faithfully,
WILLIAM B. STOCKS

22, Heatherfield Road, Marsh, Huddersfield

EXCURSION TO LONDON FOR TROOPING THE COLOUR.—The Scottish Region of British Railways has arranged cheap day excursions from Glasgow and Edinburgh to London for the Queen's birthday parade on June 12, when the ceremony of trooping the colour will take place on the Horseguards Parade. The train from Glasgow will leave Central Station at 10 p.m. on June 11 and arrive at Euston at 7.20 a.m. on June 12. Return trains will leave Euston at 11.50 p.m. on June 12 for Glasgow St. Enoch, and at 12.20 a.m. on June 13, for Glasgow Central.

THE SCRAP HEAP

Coincidence

Leaving a Walton-on-Thames train at Waterloo a passenger discovered that he had left his gloves on the luggage rack. As he hurried back another passenger came towards him with the gloves. He explained that he was the lost property man at Waterloo—and had been for 38 years.—*From the "Evening Standard."*

Women Navvies

According to the *Moniteur des Chemins de Fer* of September, 1842, nearly one-half of the labourers employed on the Vesdre Railway in Belgium were women, who were preferred by the contractors to men for works of importance because of their "superior docility, strength, and courage." "The country of Liège," it adds, "has this particularity—that the females undertake all those works which require superior skill and application that in other countries are reserved for men." Women are believed to be employed on a large scale on heavy labour by railways in the U.S.S.R. and elsewhere behind the Iron Curtain, and in some countries in Asia.

Flushed with Success?

A little girl of seven who caused the express train to stop made a very serious mistake—it meant a late arrival for 300 passengers from London to Norwich. It was a matter of chains—all explained by 54-year-old Guard Mr. Victor Bloom in an official report on a journey in which a party of schoolgirls were out on a "treat." Somebody pulled the communication cord. Mr. Bloom explained: "I walked along the coach where the cord had been pulled. I found that it had been pulled inside a toilet. When I rapped on the door, out darted a frightened little kiddy, almost in tears. 'I pulled and pulled and pulled, and I can't make the lavatory go,' she gasped as she ran past me. She was red in the face having to explain such a delicate situation."—*From the "Daily Herald."*

Esquires and Gentlemen

The old London Chatham & Dover Railway Company conferred "Esq." on all its first class season ticket holders. A mere "Mr." was considered good enough for their "second-classers."—*Letter to "The Times."*

Train Robbery (1898)

Over ½ million francs in securities and gold has been stolen from one of the vans of the Paris-Lyon-Méditerranée Company in Paris. The van left the station at eight o'clock this morning, taking a number of boxes and parcels. The driver noticed nothing peculiar until the Place de la Bastille was reached, when his attention was drawn by some passers-by to the fact that the door behind the vehicle was open. Getting off his box he found that two packages had disappeared.—*From "The Financial Times" of May* 17, 1898.

Balmoral on Wheels

(*See our May* 23 *issue*)

Queen Victoria's coach is something more than an example of nineteenth-century interior decoration; it is also a lesson in gallant railway attitudes and the inflexible Victorian will. For this is clearly a coach that a personage could live in, as though a neat slice had been taken out of the royal appartments at Windsor or Balmoral and put on wheels. There are no obvious concessions to the idea of movement, and the small white knob by the royal writing table inscribed "To stop the train—Pull" is almost superfluous. The furnishings already bring the train up quietly but very firmly to a halt . . . the royal bedroom, 12 ft. long, with its white quilted ceiling and something strange in the mood created by the twin brass bedsteads. There is character in every inch of them. Beside them is the bell-pull which range a bicycle-bell affair as large as a soup plate in the dresser's compartment. . . . The Queen firmly declined gas or electric lighting, though they were available. She insisted upon oil and candle lamps. The windows are covered with gauze to keep out sooty particles. A small compartment which ends the coach was invariably occupied by the gillie, John Brown.—*From "The Manchester Guardian."*

Rail/Air Competition in the U.S.A.

(*See editorial comment on page* 644)

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OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

EAST AFRICA

Accompanied Car Scheme Expanded

The scheme whereby railway passengers may take their car with them on the same train has been expanded to include all depot stations on the Mombasa-Kampala main line. The original arrangements, introduced in December, 1956, and reported to be becoming more popular, were for passengers travelling to and from Mombasa and Nairobi. Now passengers travelling between several other stations by the principal first and second class trains can take their cars with them. Loading is left until the last possible moment before departure so that passengers are not subjected to long delays before they themselves entrain; cars can be driven off at destination within minutes of the train's arrival.

RHODESIA

Bulawayo-Salisbury Overnight Service

More passengers are reported to be using the Rhodesia Railways £9 return inter-city Salisbury-Bulawayo service. Designed to attract business men, many of whom prefer rail to air travel, passengers holding inclusive travel tickets are guaranteed coupé accommodation and extras which include bedding, morning tea or coffee, a shoeshine, hot shaving water, and the morning newspaper; in cold weather hot water bottles are provided.

Good timekeeping is stated to have helped to make the service popular. Since January, only 11 trains on this service have arrived in Salisbury, and 16 in Bulawayo, more than 15 min. late. Other factors are the convenient departure and arrival times, the relatively central positions of the stations, and the absence of terminal delays. At present the overnight trains are diesel-hauled between Salisbury and Gwelo, the possibility of diesel traction through to and from Bulawayo is being investigated. The trains leave Salisbury and Bulawayo at 8.30 p.m. daily and arrive at 7.30 a.m.

Communication with Mozambique

Direct telephone communication with Lourenço Marques is now possible for railway departmental purposes. Hitherto telephone and telegraph messages have had to be relayed at Malvernia; alternatively, the Post Office circuits via Johannesburg have had to be used. Bulawayo and other places on the Rhodesia Railways carrier telephone system are now linked to Lourenço Marques via Gwelo.

SWEDEN

Swedish-German Train Ferry

The jubilee of the train ferry service between Trelleborg, in Sweden, and Sassnitz, now in Eastern Germany, occurs next year, when also a new German ferryboat is to be completed. The placing in service this summer of the new Swedish diesel ferry *Trelleborg* coincides with the 700th anniversary of the founding of that city.

Railway and steamer communication between Berlin and Stockholm was introduced by this route in 1897 and improved in 1909, when the train ferry was inaugurated with one Swedish and two German vessels. During the last war, passenger traffic ceased in 1942 and goods traffic in 1944. Services were gradually resumed, but ran at times to and from Warnemünde, also in Eastern Germany. Full ferry working has been in operation to Sassnitz regularly since August, 1953. Last year 102,000 passengers and 551,000 *tonnes* of goods were conveyed; for 1938 the figures were 177,000 and 275,000 respectively.

ITALY

Florence-Faenza-Ravenna Line

The Florence-Faenza-Ravenna line, which was heavily damaged during the war, has been repaired and reopened to through traffic, with a service of six diesel railcars each way daily. The last portion to be restored was that from Marradi to the summit of the line in the Apennines at Crespino.

SWITZERLAND

Discontinuance of Saloon Coaches

The Montreux-Oberland Bernois Railway ceased to operate coaches with saloon compartments as from June 1. It is reported that saloon coaches will not run on the Rhaetian Railway until further notice.

UNITED STATES

Overhauling Industrial Diesels

A total of some 15,000 diesel locomotives is now operating over the railways in U.S.A. industrial plants. To provide for their overhaul at points as near as possible to the works at which they are located, the General Electric Company has established repair centres at New York, Pittsburgh, Cleveland, Dallas, San Francisco, Atlanta, Salt Lake City, Boston, Chicago, Minneapolis and Portland (Oregon), which can complete the overhaul of locomotives of up to 120 tons in weight and 1,000 h.p. in four to six weeks.

It is claimed that at a cost of not more than 20 to 40 per cent of that of a new locomotive, the useful life of the repaired locomotive can be doubled. In 37 other cities, General Electric service shops are equipped to perform minor inspection or repair jobs on diesels.

Stainless Steel Railcars for Malaya

The first of six stainless steel railcars, built by the Commonwealth Engineering Co. Ltd., New South Wales, for the Malayan Railway, being loaded at Sydney

Changeover to Diesel Traction in Ireland

Abstract of paper delivered by Mr. T. C. Courtney to the Institute of Transport Congress in Dublin on June 4

IN 1950 the average age of the locomotive stock of Córas Iompair Eireann was over 50 years. Many had been long overdue for replacement but shortages of materials from the beginning of the war had prevented this, and had resulted in the locomotives being in a poor state of repair. Also, the conversion of a number of locomotives from coal to oil burning, interrupted maintenance; the result was that 28 per cent was under or awaiting repair.

Economic Considerations

The first issue to be investigated was whether new locomotives should be steam or diesel. Electrification would be uneconomic because of the low density of traffic. The high price of coal, compared with the cost of diesel fuel, was the main consideration in deciding in favour of diesel power units.

A review of world tendencies revealed a marked change over from steam to diesel traction. The problem facing the C.I.E. was more formidable, however, than that presenting itself to other railway undertakings because practically the whole of its motive power had to be replaced in the shortest possible time. Investigation was made of diesel traction in the U.S.A. and in most European countries before reaching a final decision as to the type of locomotives and other forms of motive power most suitable to Irish railway conditions.

The length of railway line in the C.I.E. system is 1,918 miles, which constitute 84 per cent of all the railway lines in the Republic. Figures for 1956-57 show that passenger miles were 266,163,500, and that freight traffic (merchandise and mineral) ton miles were 166,053,265. The engine mileage for the year totalled 9,788,122.

The investigation showed an annual economy of £920,000 in diesel fuel as compared with current cost of coal; a smaller number of power units than would be necessary in the case of steam, leading to consequential savings in operating and maintenance costs; elimination of the cost of coal and ash handling and other similar economies.

A scheme for the acquisition of diesel motive power for the whole of the scheduled services of the undertaking, and for the construction of the ancillary new works which would be necessary, was approved by the Government and the necessary capital expenditure by the Board was authorised.

The Board adopted the principle that sufficient diesel locomotives should be provided to haul the goods services which on the C.I.E. system operate mainly at night, and that these locomotives would be utilised during the day to haul passenger trains. Any additional motive power necessary for passenger services would be met by the provision of diesel railcars.

It was found that three types of locomotive would be needed: Type "1": Locomotives of 1,100-1,400 h.p. for main-line passenger and freight services; Type "2": Locomotives of 550-700 h.p. for passenger and freight services on secondary and branch lines; Type "3"; Locomotives of 350 h.p. for shunting duties and light loads on branch lines.

The process of acquisition of diesel motive power fell into three main sections: (1) early purchases of locomotives prior to 1950; (2) purchase of railcars; (3) purchase of main fleet of diesel locomotives.

Early Purchases of Diesel Locomotives

The first order by Córas Iompair Eireann for diesel locomotives was placed in 1945 with the Brush Electrical Engineering Co. Ltd. It covered the supply of engines and electrical equipment for five 0-6-0 diesel-electric shunting locomotives of 487 h.p. The mechanical parts were designed and manufactured at Inchicore where the locomotives were assembled. The design was based on an 0-6-0 wheel arrangement with outside coupling rods and with two motored axles. The locomotives went into traffic in 1947 and 1948. In 1946 orders were placed with Sulzer Bros. Ltd. for 815 h.p. engines and with Metropolitan-Vickers Co. Ltd. for the electrical equipment for main-line mixed-traffic locomotives. Two of these locomotives were built at Inchicore Works.

Railcars

In September, 1950, an order for 20, 125-h.p. railcars was placed with A.E.C. Limited. The order was extended to 60 cars in June, 1951, and engines and transmissions for six more which would be built at Inchicore Works were ordered in August, 1954. Thus the total number of broad-gauge railcars acquired was 66. The average cost of the cars was £18,500 each.

These railcars which had a maximum speed of 75 m.p.h. enabled running times to be considerably reduced in spite of the low power:weight ratio of 3·5 h.p. per ton. Fast operating schedules were made possible. In 1951 orders were placed with Walker Bros. Ltd. for power bogies and cabs for four railcars for use on narrow gauge lines. These cars were built at Inchicore Works and were put into service in 1952.

Main Diesel Locomotive Fleet

In 1953 tenders were invited for the supply of the main fleet of diesel locomotives consisting of three types which, with the numbers subsequently purchased, were: Type "1," 60; Type "2," 34; Type "3," 19.

The specification for these locomotives covered only general requirements, such as axle loading, load gauge, and service conditions so as to enable manufacturers to quote for standard designs.

Wide Choice Offered

Examination of the tenders showed many differences in design. Both high-speed and medium-speed engines were offered. The transmissions covered both electric and hydraulic types for the two larger sizes of locomotive and in adition mechanical transmission was offered for the smallest size.

It was thought there would be an advantage in price in favour of locomotives with hydraulic transmission but this was not found to be the case. Practical experience elsewhere of locomotives with the hydraulic transmission in the larger sizes had not been as extensive as experience of locomotives with electric transmission.

Tenders were accepted for the two larger types, but later the C.I.E. decided to build, in 1954, its own rigid frame three-axle shunters with 400-h.p. Maybach engines and Mekydro hydraulic transmission.

Subsequently, 12 AIA-AIA 960-h.p. Birmingham-Sulzer diesel, electric three Walker narrow-gauge 212-h.p. diesel-mechanical, and three 130-h.p. Deutz diesel-hydraulic locomotives were obtained around 1956, 1955 and 1954 respectively.

Maintenance and Overhaul Facilities

Because high availability and reliable performance in service are characteristic of successful diesel traction, terminal facilities must be such that they contribute to this. The locomotive workings for C.I.E. had been planned on an all-line basis and this permitted of a high proportion of scheduled inspection and running maintenance being caried out at the central sheds and workshops at Inchicore.

The boiler and tender shop was completely remodelled at the cost of £64,000. Four servicing and inspection bays for locomotives were provided, three work levels being incorporated. Pipe lines were installed at each bay for the supply of fuel oil; lubricating oil; compressed air for cleaning and operating greasing equipment; demineralised water for battery top-up; chromated water for the engine cooling system. Electrical connections were provided for battery charging and portable inspection lamps.

A special pump room for the testing, calibration and overhaul of injectors and fuel pumps, and facilities for the cleaning, oiling and draining of air filters, and for the repair and testing of instruments and gauges was provided.

Special facilities for the maintenance

and servicing of diesel railcars were also constructed at Inchicore Central Works. Reconstruction schemes were carried out in four other centres for the establishment of maintenance depots for railcars and locomotives.

The erecting shop at Inchicore, formerly used for steam locomotives, was altered and facilities were provided for heavy examination of diesel locomotives and for the overhaul of engines and electrical equipment. Special machine tools and cleaning equipment for engine components, testing equipment, and varnishing equipment have also been installed.

The repair of railcars is also undertaken at Inchicore. Engines, gearboxes and transmission equipment are dealt with on a unit replacement basis by reconditioned units supplied by a workshop engaged solely on engine and gearbox repairs. Wheel turning and the running and brake gear on the bogies are attended to at the same time as the power units and this is followed by repairs to the coachwork and painting.

The storage and distribution of fuel oil has been met by the provision of main storage tanks of 500-ton capacity at both Cork and Dublin. Connections are provided at Cork to the quayside so that delivery can be taken direct from seagoing tankers. Twenty rail tank cars were built at Inchicore to distribute fuel oil to small storage tanks provided at various refuelling depots throughout the system.

Train Heating

Several schemes were considered for the heating of diesel-hauled passenger coaches but as the stock was already piped and fitted for steam heating it was decided to retain this method. It was felt, however, that steam generators on the locomotives were an undesirable complication and 41 four-wheel combined luggage and heating vans equipped with boilers of 1,000 lb. per hr. capacity were built at Inchicore. Similar boilers of half this capacity were incorporated in the railcars.

An important aspect of the change to diesel traction was the necessity for purchasing and storing a large variety of spares and replacement units of proprietary manufacture. This break with the traditions whereby the railway workshops manufactured most of the spares required for steam necessitated re-assessment of the procedure for providing and storing spare parts.

Contracts placed for the new locomotives included a supply of spare units recommended by the manufacturers and also initial quantities of consumable spares. Stores limits were then determined and arrangements made for the purchase of spares on a stock recoupment basis.

Staff Training

Early attention was paid to the instruction and training of maintenance and operating staff; it was specified in all contracts that the manufacturers should provide training courses for C.I.E. personnel. Engineering staff pursued a course of training lasting six months at the various works engaged in the construction of the locomotives. They saw all aspects of the manufacture, assembly and testing of the various components and completed locomotives, and were also instructed on the maintenance and operation of the locomotives by the technical staff of the various contractors.

Courses of six months' duration for shop grades were also arranged and fitters and electricians were sent in groups over the period November, 1954, to December, 1955. In March, 1956, a further group attended the works of Maybach Motorenbau G.m.b.H. at Friedrichshafen for training on the Maybach engine and transmission.

At the beginning of 1955 only a small number of drivers had experience of driving diesel locomotives due to the fact that only two line locomotives and five shunting locomotives were available. A considerable number of drivers, however, had experience of diesel railcar operation. Four technical assistants and four locomotive inspectors were sent to the manufacturers' works to be trained on the operation of the new locomotives. A replica of a locomotive cab fitted with actual instruments and controls was made and installed at Inchicore. At each phase of the training the driver was examined and passed as competent. Finally, having completed the course of instruction, drivers were placed on trains worked by the new diesel locomotives.

Having obtained instruction on the main line locomotives, drivers were later given short courses to familiarise themselves with other types of locomotive.

Single-man Operation

Single-manning of the five original diesel-electric shunting locomotives, when working within the limits of the shunting yards, had been accepted by the trade unions. Single-manning of railcars had also been accepted after certain adjustments had been made in the signalling regulations in regard to train token exchanges on single lines.

To cater for the redundancies resulting from this decision the Board undertook from the date of the agreement to retain in their grades all appointed drivers and to provide alternative employment in other departments without loss of rate to all firement no longer required for footplate duties.

Effect on Traffic Working

By March 31, 1958, all diesel motive power purchased by the Board had been delivered and had been put into service except two locomotives of 550 h.p. and one of 400 h.p. Some fifty-one locomotives and two railcars went into service during the financial year 1957-58, so the full effect of the introduction of diesel motive power will not be known until the end of the current financial year.

The following statistics of steam locomotive operation for the year 1951-52 and of diesel locomotive operation for the year 1956-57 reflect some of the improvements obtained from the change over to diesel traction:—

—	Steam 1951-52	Diesel 1956-57
(*a*) Total engine hours per train engine hour (passenger) ..	1·35	1·07
(*b*) Total engine hours per train engine hour (freight) ..	2·15	1·45
(*c*) Train miles per train engine hour (passenger)	17·85	31·11
(*d*) Train miles per train engine hour (freight)	10·93	16·62

In the case of railcars, during the first few years, many modifications to the equipment were made and maintenance inspections and procedures were initiated to overcome persistent defects. The major mechanical and electrical problems have been solved and a high degree of reliability obtained.

In the case of the locomotives the problem-solving stage has not yet been passed but most of the initial difficulties have been eliminated.

From both the railcars and the locomotives, taking into account units stopped for all reasons, an availability of 80 per cent has been achieved.

Economies

The total cost of fuel for the year ended March 31, 1952, was £1,571,241, and for the year ended March 31, 1958, it amounted to £854,704, that is, a reduction of £716,537. The engine mileage worked in the latter year was 95 per cent of that worked in the former year. If allowance is made for the increase in the cost of coal between 1951-52 and 1957-58, the saving in fuel costs would work out at about £1 million for the year 1957-58. The full diesel fleet was not in service during that year and it is estimated that there will be an additional saving of £120,000 in the cost of fuel during the year 1958-59. Thus the cost of fuel will be about £840,000 per annum less than it was in 1951-52 and would amount to nearly £1,120,000 per annum if increases in the cost of coal since 1951-52 were taken into account.

It is not possible to give the full cost of maintenance and overhaul of the diesel locomotives because part of this work is still being done by the contractors under the terms of the conditions of contract. The actual expenditure by C.I.E. on repair and maintenance of diesel locomotives during 1957-58 worked out at one shilling a mile. This cost is expected to increase when the guarantee period expires.

The total staff engaged on train operation at the beginning of 1952 numbered 2,124, and at the beginning of 1958 this had been reduced to 1,465. The reduction of over 30 per cent was attributable largely to the change-over to diesel traction. The expenditure on wages of train operating staff in 1957-58 was £135,000 less than in 1951-52. If allowance is made for wage increases in the interval the reduction would amount to £215,000.

The Organisation of Transport

Abstract of paper delivered by Sir Brian Robertson to the Institute of Transport Congress in Dublin on June 5

THE first exponent in Britain of the principle of co-ordinating the various means of transport was Sir Eric Geddes, Deputy General Manager of the North Eastern Railway and the first President (1919-20) of the Institute of Transport. He was appointed by the coalition Government in 1918 to the new Ministry of Transport to implement the policy of co-ordination. It was a severe shock to Geddes to find himself bitterly attacked as Minister of Transport by many of his old friends. This was because his principle of co-ordination by the State seemed to lead too easily in the direction of State ownership, although he seems to have had no such intention. The principle that the State has a responsibility for the co-ordination of the different agencies of transport received some recognition between the wars. A Royal Commission discussed it in 1929-31, and later it coloured the deliberations of the conference which sat under the chairmanship of Sir Arthur Salter. When war broke out in 1939 some measure of co-ordination had been introduced. War again induced the Government to take control of the railways and, in a measure, of road haulage also.

If the principle of co-ordination of transport by the State is a true principle, it should be in evidence in all well-developed countries; that is the case, including France and Western Germany, in which latter country Government economic policy has been *laisser-faire*.

The Transport Act of 1947 prescribed the solution for the whole problem on the basis of the integration of the means of transport under a single and national ownership. The Act of 1953 deliberately dropped the principle of integration; the basic principle was that of competition on the grounds that co-ordination is best left to work itself out through competitive processes. Greater freedom was given to the railways, particularly as regards charges. They were not, however, given complete freedom in this respect, although the road haulier does enjoy precisely this. The competitive principle was not pushed to extremes. A system of licences remained both for road passenger vehicles and road haulage; without this system many road hauliers and omnibus companies would probably go quickly out of business, and the public would suffer. The Government also exercises a form of control particularly important in relation to the co-ordination of the means of transport—its control on budgetary expenditure. The Government directly controls new investment in British Railways and other nationalised transport undertakings, also new investment in the road system.

The British Transport Commission tries to balance the operations of its divisions and particularly to co-ordinate rail and road, not by subordinating the interests of one means of transport to that of another, but by ensuring that all means at its disposal are exploited to give the best service. Competition in the field is encouraged, as is competition between the railway Regions, but care is taken to ensure that the various divisions do not compete with each other at the expense of the Commission. The Commission might do more in the matter of the co-ordination of its resources than it does at present. The railway passenger services and provincial omnibus services are not as well co-ordinated as they should be. The railway freight services and British Road Services should be geared into each other much more closely than they are. There are some obstacles, but the obstacles are less significant today and might be overcome. When traffic depots, rail or road, are being reorganised care is taken to ensure that they are designed to handle both rail and road traffic. It is hoped to abolish the separate collections of parcels and smalls for rail and road services. Much is being done to co-ordinate our rail and road services on the one hand and shipping on the other.

Area Boards

Co-operation between the nationalised road and rail services of Britain has been hampered in the past by the system of centralised functional control on British Railways. In the scheme now being worked out for the decentralisation of management on the railways, endeavour is being made to obtain an approximate harmonisation of the areas of responsibility of subordinate managers of the rail and road services respectively. A very important feature has been the creation of the Area Boards. These boards, as is generally known, are responsible for the supervision of the Railway Regions. They have not been called Regional Boards. It has been the intention ever since they were set up in 1954 that they should be an instrument of co-ordination. They are already instructed to "acquaint themselves with the general transport position in their areas so that they may advise the Commission on the situation from time to time." There is a certain degree of inter-locking between the membership of the Area Boards and the road services, passenger and freight. On several specific occasions when co-ordination has seemed particularly necessary the Commission has instructed an Area Board to take charge of the position. A provision was inserted into the Act of 1954 to enable the Commission, subject to the approval of the Minister of Transport, to delegate to Area Boards responsibilities in addition to those relating to railways and shipping services. It is hoped to work towards a position in which the name Area Transport Boards would be appropriate.

The principle that the individual should be free to make his own choice between the means of transport does not imply that the decision as to what means of transport should be provided in the national interest can be determined by a kind of Gallup poll among users. Governments should have a transport policy and exercise sufficient controls to ensure a co-ordinated public transport system best designed to serve the needs of the country as a whole.

The answer to the question how far Governments should intervene to achieve this, should be "far enough to achieve a good result and no further." The way in which the State should control transport is much more difficult to determine. Some very intricate suggestions have been made to devise controls which might ensure that each means of transport is given such a handicap as shall ensure that it may play exactly the correct part in the country's transport operations. All these exercises in arithmetic appear to fail because they presuppose that conditions are and will remain the same throughout the country and industry.

Control of national investment, fiscal policy, licensing and control of fares and charges are the normal methods available to Government for co-ordinating the various means of transport and encouraging each in the field of operation for which it is best suited. Licensing should be in the hands of a tribunal appointed by, but independent of, Government. If fares and charges must be controlled for any part of the public transport industry, they should be controlled for all, and the control should be in the hands of the same tribunal as is responsible for licensing. If Governments control these things themselves, it is impossible to keep them free from political influence. A single tribunal, with sub-committees as necessary, should preside over the whole field of transport. In the United Kingdom this is not the case. The Interstate Commerce Commission in the U.S.A. is a good instrument from this point of view.

The function of co-ordination is then effected by the Tribunal, acting under policy directions from government. Governments in framing their policy instructions must rely more upon the judgment and common sense of the Tribunal. They will also, in determining their policy, find it useful to draw upon the advice, not only of the transport industry but also of those who use its services. The Transport Users' Consultative Committees in the United Kingdom can be very helpful.

Brunel Papers

Original records of I. K. Brunel's work on the Royal Albert Bridge, Saltash

The Royal Albert Bridge over the Hamoaze at Saltash under construction in 1858

ISAMBARD KINGDOM BRUNEL was responsible for construction of the Cornwall Railway from Plymouth to Truro in 1847-59. The railway, built to the broad (7-ft.) gauge, was absorbed by the Great Western Railway, which Brunel also had constructed, in 1876. Its many bridges included the Royal Albert Bridge over the Hamoaze at Saltash. In July, 1858, the second of the two great trusses of that bridge was floated out from the shore, preparatory to raising into position high above the river. The bridge was opened by the Prince Consort on May 2, 1859.

Records of these busy years of Brunel's life which had been preserved at Paddington have now been brought together by the Archivist of the British Transport Commission to form a slender volume of original documents on the Cornwall Railway. Some are written in haste by the engineer himself, others in clerk's copper-plate handwriting of the pre-typewriter age. The pathos of these documents shows not simply Brunel the great engineer, but Brunel the man.

Impatience and anger come out with admonition to his assistants on the bridge with: "You must get to work immediately and re-erect the scaffolding without a day's delay—there seems to have been great want of judgment"; also: "I am much surprised and displeased to find that now after several weeks notice you are unprepared with the means of unloading the presses when they arrive . . . you seem to have entirely neglected to make any preparation—and to treat the matter now as unimportant. . . . Pray do not cause a further delay by dropping or damaging the presses. . . ."

Informality is shown in a letter in his own hand, asking for the flags used at the floating of the first span of the bridge to be sent urgently to him at Millwall, illustrated with two little sketches: "I mean the flags of this sort . . . not the square ones . . ."

Importance of Civility

Solicitude for the success of the Royal Albert Bridge, Saltash, is marked in a letter dated April 28, 1857 in his handwriting: "I take this opportunity of impressing upon you the necessity of paying great attention and shewing great civility on all occasions to the various persons in authority that you may come in contact with. We shall be particularly dependent during the various operations of the next twelve months upon the goodwill displayed and the assistance afforded by all sorts of people from the First Lord of the Admiralty to the Mayor of Saltash—or the capt. of the steamship—and you must be particularly careful and see that *all about you are the same* not by any chance or mistake to offend anybody but on the contrary to seek to conciliate everybody. We shall want help from the Dockyard of all sorts and anybody in authority there could embarrass us very much—and we did once deeply hurt one of them by refusing him admission on the works. We shall want the navigation stopt—we shall want the good will of fishermen, lightermen, steamboat men and indeed of everybody, therefore seek any opportunity of getting and keeping on good terms with everyone—and of course you must be particularly courteous to the Dockyard Authority."

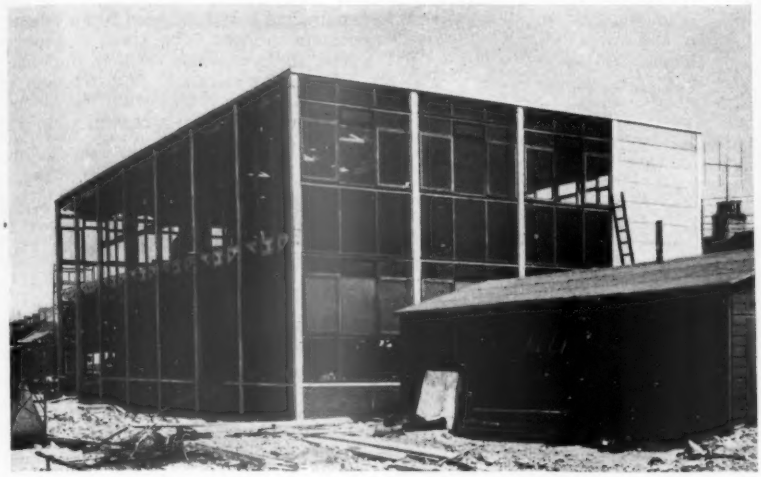
The most poignant of all is the last document in the file, dated August 20, 1859, from 18, Duke Street, Westminster, in a clerk's copper-plate. It is a report addressed to the directors of the Cornwall Railway Company, on completion of the line, stating: "The works were tested by the Government Inspector and the Railway opened for Public Traffic on the 4th of May, the Royal Albert Bridge at Saltash having been previously opened by His Royal Highness in person. Since the opening of the Railway the Works and Permanent Way have stood well and the Viaducts are in a very satisfactory condition."

At that time Brunel was a very sick man: the earlier reports had the subscription in his handwriting "I am, Gentlemen, Your obedient servant, I. K. Brunel"; but on this last document the clerk had written all but the signature; and under the copper-plate handwriting appears, in pencil, a deliberate but shaky "I. K. Brunel". An unknown hand has added underneath in pencil "Died 15 Sep. 1859."

*Down "Cornish Riviera" hauled by diesel-hydraulic locomotive No. D*600 *crossing the Royal Albert Bridge; the photograph was taken from the same spot as that reproduced above*

New Goods Depot at Peterborough

Stage I of a comprehensive long-term modernisation plan



Office block nearing completion, showing pre-cast and pre-stressed framework

WORK is now in progress on the construction of a new goods depot at Peterborough, North Eastern Region, British Railways, which, when completed, will greatly improve the movement of freight sundries traffic over a wide area. This scheme, which also includes the provision of a new Road Motor Engineers' Depot represents the first stage of long-term comprehensive plan for the modernisation of Peterborough North, embracing the reconstruction of the passenger station and its rail approaches.

The new goods depot is being built to the north of the existing passenger station between Spital and Westwood bridges. The site joins a road which is to be developed as a main route and is conveniently situated in relation to the marshalling yards. Space is also available for the new road motor depot which will be conveniently placed for the maintenance of the vehicle fleet.

Slat Conveyor

The new depot is designed to deal with 116 wagons under cover and 185 in the open, 118 of the latter will be in working positions with road access. A slat conveyor will be provided for inward sundries traffic, flanked by two lines each holding eight wagons so that each line of wagons can be unloaded in turn on to the conveyor. Wagon movement alongside the conveyor will be by capstan, and continuous working will be achieved without stoppages for shunting. Mobile cranes will be available for heavy lifts.

Outward sundries traffic will be dealt with on the perambulation system and accommodation is planned for 100 wagons under cover for direct loading from road vehicles.

Traffic for re-forwarding by rail will be discharged to the conveyor, sorted on to trailers and perambulated to the appropriate wagons. The trailers will be hauled internally by electric tractors. Full load traffic will be dealt with by mobile crane, or manually, as necessary.

Goods Shed

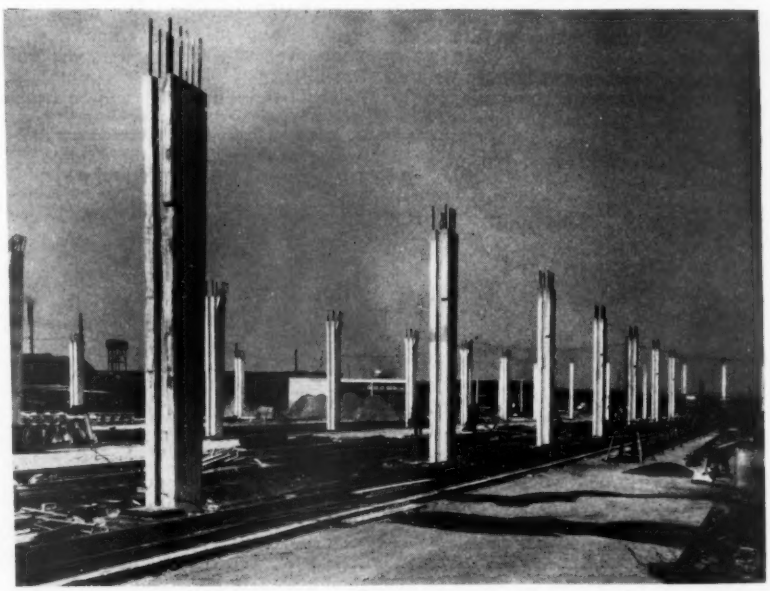
The area allocated for internal movement is 572 ft. long × 104 ft. 8 in. wide covered by a concrete barrel roof, 2½ in. thick. In the 13 bays the roof will be supported on transverse reinforced concrete beams, 8 ft. 6 in. deep and 2 ft. wide carried on reinforced concrete columns 1 ft. 9 in. thick and tapering from 3 ft. 9 in. wide at their tops to 2 ft. 6 in. at ground level. The columns will be placed at intervals of 44 ft. longitudinally and 52 ft. 4 in. transversely. The transverse beams are to be cantilevered 26 ft. 2 in. from these columns to carry a flat slab forming a canopy along the whole of the east side together with four bays on the west side of this area.

The loading dock and conveyor will be situated on the west side. They will be covered, over an area of 396 ft. long × 98 ft. 6 in. wide, by a flat reinforced concrete slab, 5 in. thick, carried on transverse prestressed concrete beams, 8 ft. 6 in. × 3 ft. 9 in. overall and 98 ft. 6 in. long supported on reinforced concrete columns Due to the unsatisfactory nature of the subsoil it will be necessary to carry the load from the columns, estimated to be 200 tons maximum, by deep foundations to the rock below the fill.

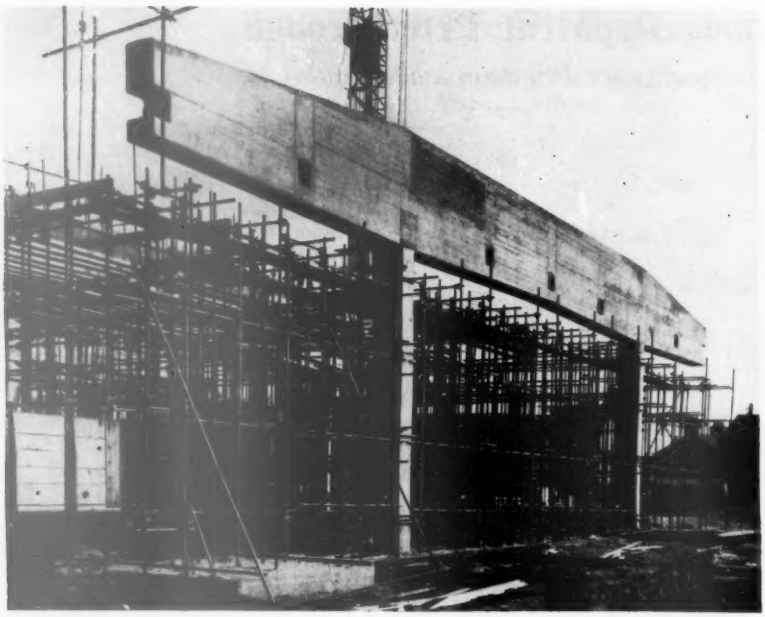
Glazed Windbreak

The north or buffer stop end of the shed is to be closed by a windbreak totally glazed from roof to within 7 ft. of the ground, the bottom 7 ft. being filled with brickwork to avoid damage from vehicles using the roadway inside and outside the wall. The other three sides of the shed will be left open, to permit passage of lorries to and from the perambulating areas. A further windbreak will be built running longitudinally North to South along the eastern line of columns. This will be suspended from the roof to within 7 ft. of ground level and will be glazed.

Adequate daylight at working level in the shed will be ensured by the extensive use of glazed pavement lights



Site of goods shed, showing reinforced concrete columns in position



Goods shed under construction, showing transverse reinforced concrete beam

in the crown of each of the concrete barrels of the roof, and in the flat roof over the conveyor, and of glazed dome lights in the cantilever canopies. In addition, the vertical arches formed by the ends of the barrels rising above the general level of the main roof will be totally glazed.

The whole of the perambulating area under cover and a considerable area outside the cover, a total of above 22,500 sq. yd., is to be paved with either tarmac or asphalt. The existing cattle pens are to be demolished and replaced by a more modern and hygienic installation to the requirements of the local veterinary authority.

In addition to the Goods Shed, a number of other buildings are to be provided.

The goods office will be a two storey building containing accommodation for clerical staff and staff amenities for the whole depot. A public enquiry lobby is provided on the ground floor and a small office for the depot police adjoins the main entrance.

Road Motor Depot

The new road motor depot will be about 7,000 sq. ft. in area and will include repair shops, cleaning facilities, and offices. It will provide adequate accommodation for the 75 motors and 95 trailers based at Peterborough.

The Mechanical & Electrical Engineer's accommodation is sited in the north-west corner of the site and comprises electrical transformer and switch rooms, a garage for battery vehicles and the yard crane, a workshop, straw store, and some staff amenities.

These three buildings will be framed with pre-cast pre-stressed factory made concrete units with concrete aggregatet faced panels forming the solid areas of walls. The wall areas between the columns will consist of full height timber frames with infill panels of vitreous enamelled metal, bonded to an asbestos cement sheet backing. Finishes generally are chosen for their durability, pleasing appearance, and freedom of maintenance. Heating will be by convected hot air from a central automatic oil fired boiler.

Small Buildings

Other small buildings to be provided comprise a petrol issuing and weighbridge building, yard foreman and checkers offices and vacuum brake testing building, shed foreman and capstanmen's office, vulnerable store, incinerator building, Signal Engineer's accommodation, and an extension to an existing ground frame cabin.

The construction of these small buildigs consists mainly of brick cross walls with timber framed infilling panels of a similar character to those used on the principal buildings. Flat roofs are used throughout, and heating is by electrical convectors.

The fencing of the boundaries of the site to Westwood Street and Westwood Bridge will consist of galvanised metal uprights carrying expanded metal mesh covered by vitreous enamelled metal panels.

The layout for the new scheme was drawn up by staff of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region, British Railways. Sir William Halcrow & Partners are carrying out the civil engineering and architectural work for the shed on his behalf. The Regional Architect, Mr. H. H. Powell, under the direction of the Chief Civil Engineer, undertook the design of offices, road motor depot, and staff accommodation. The contractors for the goods shed, roadways and tracks are C. R. Price Limited, London, N.W.9. The construction of the office and staff buildings is being undertaken by Gilbert Ash Limited, London, W.1.

Steam and Diesel Power in Malaya

Photo] *[V. J. Maratea*

Night mail from Singapore arriving at Kuala Lumpur; on left, one of the recently delivered diesel locomotives

ELECTRIC RAILWAY TRACTION SECTION

Origins of D.C. Voltages

WHEN the report on the adoption of single-phase electrification at 50 c/s was published by the British Transport Commission in 1956, it was stated that consideration was being given to converting the Manchester - Bury line of the London Midland Region to that system at 6·6 kV. At that time the approaching necessity of renewing the rolling stock on this service was expected to provide an opportunity for the electrical conversion, but it has now been decided that the new vehicles are needed sooner than they could be put into traffic if their introduction were dependent on completion of a new overhead system. The decision to retain the existing 1,200-V. d.c. electrification with side-contact third rail on the Manchester - Bury line was recorded in our May 23 issue in connection with the placing of a contract with the English Electric Co. Ltd. for 26 four-motor multiple-unit equipments for installation in the new rolling stock. A system unique in this country both in voltage and method of collection has thus been reprieved—an event which no doubt is a reflection of the change in economic circumstances since 1956, rather than of any second thoughts over the practicability of installing a 6·6-kV. system on a line noteworthy for its clearance problems.

The reason for choosing 1,200 V. in the first place for the Manchester - Bury line was that this was considered the highest practicable voltage for collection from a third rail. Other factors may have influenced the decision, such as the successful operation of the 600-V. motors designed for the Liverpool - Southport electrification, and the possibility of using similar machines connected two in series, as in fact was done in the original Manchester - Bury stock. Multiples of 600 characterised the Lancashire & Yorkshire electrifications in the first quarter of the century, and it will be recalled that 3,600 V. was the figure chosen for the high-voltage experiment between Bury and Holcombe Brook in 1912. Originally 600 was regarded as a "railway," and 500 as a "tramway" voltage. Today the multiples of the "tramway" voltage—1,500 and 3,000—have become established in d.c. practice, but it would be hard to find a single reason why these figures have been chosen, their emergence having most likely been the result of numerous factors. Availability of equipment and materials cannot be discounted. Much might turn on a chance such as the cross-section of a contact wire manufactured for tramways being suitable for a railway load at 1,500 V.

Commenting in 1914 on the progress of railway electrification, *The Electrician* observed that "during the last 10 years the voltage of electric traction systems has been raised in many cases from 500 or 600 to the higher limits of 750 and 800." The difficulties of going higher than this were emphasised in an article reproduced in the same periodical at this period, abstracted from a contribution to *Elektrotekniscbe Zeitschrift* by Hermann J. Mulder. Here the author remarked that "equipment suitable for 1,000 and even 1,100 V. was found quite useless at 1,200 V." The problems were already being surmounted, however, and the author gave his opinion that "in the light of experience there seems no reason why direct current switchgear should not be constructed for 1,500 or even 2,000 V., always assuming that the output is not increased." Contemporary comment of this kind throws into relief the advanced thinking of Dick, Kerr & Co. Ltd., which was incorporated in the English Electric Co. Ltd. in 1919, in undertaking the Bury - Holcombe Brook experiment in conjunction with the Lancashire & Yorkshire Railway. In the light of present practice on 3,000-V. d.c. railways of operating 1,500-V. traction motors connected two in series, the operation of the Bury - Holcombe Brook motors at the line voltage of 3,500 must still be considered a bold venture.

Early generating practice had its effect on the evolution of traction supplies. The three-wire systems once so widely used by municipalities had a railway counterpart in Thury's experiments in Switzerland, where two contact wires were each at a potential of 1,200 V. to earth so that high-voltage distribution at 2,400 V. was achieved without any part of the equipment being at more than 1,200 V. relative to the neutral conductor constituted by the track. Interesting as this solution was at the time, the drawback of its double overhead system told against it, and three years later a further section of the same line was electrified at 2,400 V. to earth. The same voltage was used subsequently on various systems in the U.S.A. Although today the figures of 1,500 and 3,000 V. are international standards for direct current electrification, there are some who think that an intermediate value, such as 2,000 V., might have changed the present trend of electric traction practice if it had been adopted, by providing a reasonable measure of the advantages of high voltage at less cost than with 3,000-V. systems.

Techniques for Economy

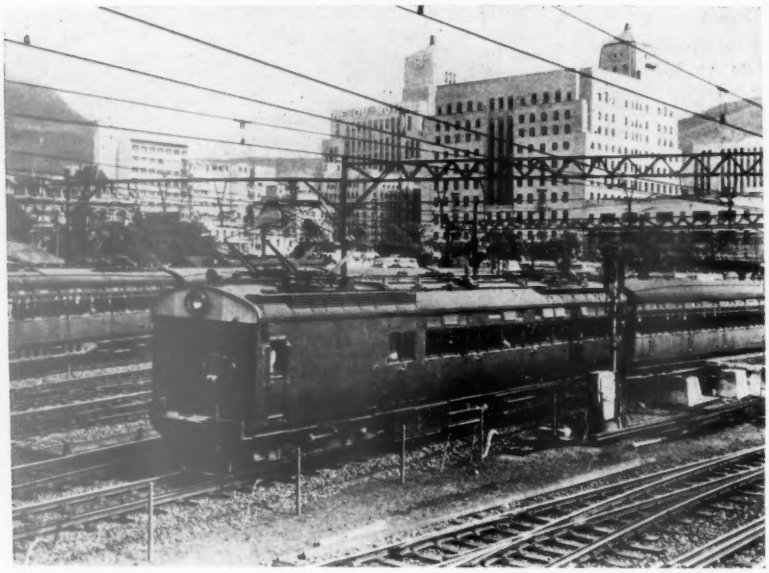
WHILE the search for immediate economies by eliminating unremunerative services must continue, it should be against a background of studying new techniques for long-term policy. In this connection the recent French National Railways electrification from Dôle to Vallorbe and Pontarlier, described on another page, is remarkable because of the operating methods adopted and the developments planned. The capabilities of the 50-cycle Bo-Bo rectifier locomotives of the "12000" class have reduced the motive power requirements of the line by eliminating most of the double-heading and relief train working previously required, with consequent savings in locomotive mileage. This in turn has made it possible to accommodate the traffic on a single track for some 35 miles in all of the route between Dôle and Frasne, so that the initial outlay on overhead construction was reduced and future maintenance costs will also be lower.

In achieving these results, electrification has the support of new techniques in the remote control of signalling which will contribute to the safe and expeditious handling of traffic on the single-track sections. A practical demonstration is being given, in fact, of the situation commented on by Mr. J. H. Tyler in his Presidential Address to the Institution of Railway Signal Engineers (see our May 23 issue) when he said that the railway signal engineer had at his disposal today technical means which would enable more traffic to be moved over fewer tracks in greater safety than ever before. The remote control system to be adopted will be electronic, a principle which allows considerable savings in time in the transmission of controls and receipt of return indications compared with conventional centralised traffic control methods using coded d.c. impulses. Provision has been made for inductive telephony between the controller, ultimately to be stationed at Dijon, and the drivers of locomotives, and for the traffic to be regulated during parts of the day by a programme machine.

The general electrification scheme therefore is an example of what can be achieved by co-ordinated modernisation in the two spheres of traction and signalling. Its operation deserves to be studied closely in relation to the future of lines elsewhere on which there is important through traffic but diminishing local requirements. If the electrification of busy main lines with d.c. had proceeded more rapidly in this country, it is possible that 50-cycle traction would still have found useful application on some cross-country and secondary routes where these conditions exist and would probably have faced a less controversial future.

S.A.R. Cape Western System Motor Coaches

Equipments for 3,000-V. d.c. suburban routes in the Cape Town area



Suburban train with Metrovick 3,000-V. d.c. equipment leaving Cape Town Station, South African Railways

ELECTRIFICATION of the Cape Western main line, South African Railways, at 3,000 V. d.c. made it necessary to convert some existing 1,500-V. d.c. suburban stock in the Cape Town area and to provide a number of new multiple-unit trains for the extended electric services which then came into operation.

A map of lines concerned appeared in our August 21, 1953, issue. Twelve conversion sets and 66 complete electrical equipments for new rolling stock built by the Birmingham Railway Carriage & Wagon Co. Ltd., Cravens Limited, and the Metropolitan-Cammell Carriage & Wagon Co. Ltd. have been supplied by the Metropolitan-Vickers Electrical Co. Ltd.

Electrical Equipments

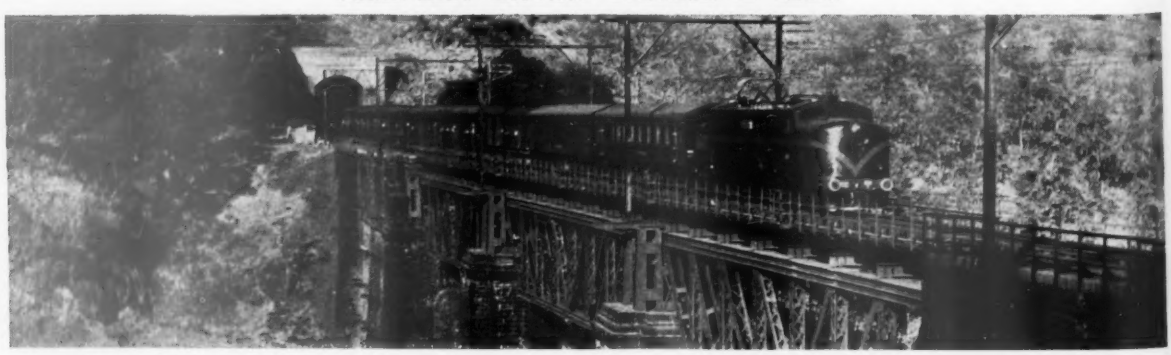
The equipments differ in certain respects from those for the Reef lines which were described in our issues of June 10, 1955, and March 14 last. Self-ventilated motors are used instead of the forced-ventilated type made necessary by the altitude of the Reef system (6,000 ft. above sea level). Automatic acceleration is controlled by separate relays in the series and series-parallel groupings of the motors, and a field tapping is used for the weak-field notch instead of an inductive shunt.

Trains are made up of two motor coaches and four trailers, two motor coaches and six trailers, or three motor coaches and six trailers. The four motors in a motor coach are axle-hung and drive through torsionally-resilient gearwheels. The motors are insulated for 3,000 V., but the two machines in a bogie are connected permanently in series so that the nominal maximum terminal voltage is 1,500. Full-field ratings at 1,450 V. are 305 h.p., 170 amp., 1,040 r.p.m. (one-hr.), and 268 h.p., 150 amp., 1,070 r.p.m. (continuous). Cooling air is drawn through ventilators in the roof at the driving end, passes into an air settling chamber, and through Vokes dry filters into an air intake chamber. From here it passes along ducts in the underframe to the leather bellows leading to the traction motors. Air for the motor-generator set is also drawn, through a filter, from the air settling chamber. The arrangement of h.t. and l.t. switchgear inside the motor coach body is similar to that of the Reef stock.

Auxiliary Equipment

Auxiliary machines comprise a Westinghouse compressor and exhauster, and a 3,000/110-V. motor-generator set, all carried on the underframe, as are the main resistances and the m.g. resistance. In the earlier Reef stock the m.g. set drives the traction motor blowers, and a separate motor-alternator set is provided to supply the fluorescent lighting. The Cape Western stock, however, has d.c. fluorescent lighting in the first class coaches, supplied in the same way as the filament lighting from the motor-generator set, and a polarity reversal relay therefore operates every time the motor coach reverses in order to prevent end-blackening of the tubes.

Main-Line Electric Traction in India



Central Railway train hauled by English Electric 1,500-V. 3,600-h.p., locomotive crossing the Ehegaon Viaduct, on the (Bombay) Kurla-Igatpuri section

Japanese High-Speed Multiple-Unit Stock

Designs for suburban and main-line services on 3-ft. 6-in. gauge

Photo] [Tadanao Miki

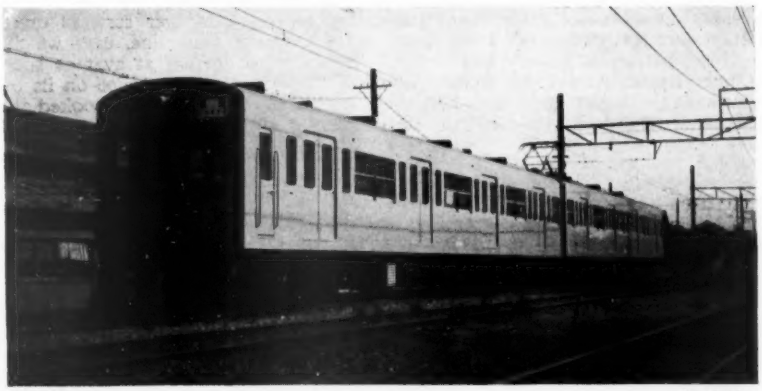
Lightweight eight-car high-speed set, Odawara Express Electric Railway

THE policy of the Japanese National Railways is to use multiple-unit trains even for long-distance services on electrified lines, because of the quicker acceleration and higher speeds obtained as compared with locomotive-hauled trains. Steps are being taken to decrease noise and vibration in multiple-unit trains running at high speeds.

Suburban Sets

Although the present congestion on the Tokyo and Osaka suburban services will be relieved eventually by laying additional tracks, the J.N.R. has obtained increased capacity from the existing lines by the introduction of new 1,500-V. d.c. rolling stock with improved rates of acceleration and retardation. Last year 170 of the new vehicles were ordered. The basic train unit consists of two permanently-coupled motor coaches, each of 1,034 h.p., the power being provided in each vehicle by four lightweight, high-speed motors running at 1,800 r.p.m. when developing the above one-hr. rating and at 4,620 r.p.m. when the train is travelling at its maximum permitted speed of 60 m.p.h. The motors operate at 375 V.; they are connected four in series and controlled as a single eight-motor equipment divided between the two adjacent motor coaches. Flexible transmissions are installed to reduce unsprung weight.

Each coach of the new trains measures 65 ft. 7 in. overall and accommodates either 158 or 168 passengers. The weight of a coach is 35 tons. Trains are usually made up of 10 coaches in various combinations of motor coaches and trailers; a usual formation consists of six motor coaches and four trailers. Rheostatic braking is available in conjunction with the normal air brake.



Photo] [G. Nishio

Two permanently coupled motor coaches of new J.N.R. multiple-unit suburban stock

Two-leaf air-operated sliding doors assist in shortening station stops. The ventilation system has been improved so as to take in external air at roof level for cooling the traction motors in summer, and in winter to draw the air from inside the coaches, so minimising the entry of snow into the motors with the air stream. Oscillating fans mounted under the roof ventilators assist the cooling of the vehicles in summer.

Photo] [G. Nishio

Eight-car train of the Odawara Express Electric Railway

Articulated Trains on Private Railway

The maximum speed of 90 m.p.h. attained by a multiple-unit train on the Tokaido line of the J.N.R. on September 27, 1957, referred to in the editorial article in our October 18 issue, was achieved by one of the three eight-car, lightweight articulated sets built for the

Odawara Express Railway, a private system with a 53-mile main line running westwards from Tokyo.

Riding is reported to have been very good, at speed, with minimum vertical and lateral vibration. This was demonstrated by a cup of water filled to the brim which had been put on a table and never spilled even at 145 km.p.h.

As far as can be ascertained from observations of vibration and stresses, and of the behaviour of the pantograph, the prototype should be capable of attaining 160 km.p.h. (100 m.p.h.).

The vehicles are carried on Schlieren two-axle bogies and a train weighs 147 tons empty. With a complement of 354 passengers, the weight is 167·3 tons and the power/weight ratio works out at 9·6 h.p. per ton.

The eight-car train incorporates 12 traction motors of 134 h.p. which operate through flexible drives incorporating transmission shafts passing through the hollow armature shafts. Multiple-unit control with automatic acceleration is provided, the accelerating rate being 1 m.p.h.p.s. Rheostatic and air braking operate on the motored axles and act in conjunction with disc brakes on the other axles of the train. Maximum retardation is 2·5 m.p.h.p.s.

The performance of this "S.E." (Super Express) train was studied with particular interest by the Japanese National Railways, in view of their own intention to use multiple-unit stock for express passenger services on the Tokyo-Osaka main line, over which it is hoped to operate at average speeds of 52-55 m.p.h. In service on its own system, the "S.E." train is booked at an average of 51 m.p.h., which exceeds by approximately 1 m.p.h. the present fastest time on the J.N.R.

Consideration is also being given by the J.N.R. to multiple-unit working on its industrial-frequency a.c. lines by the installation of rectifiers in the trailer coaches of trains of this type.

Photo] *[G. Nishio*

Japanese National Railways multiple-unit train for Tokyo and Osaka suburban services

British-Built Electric Locomotives in Spain

Spanish National Railways freight train hauled by an English Electric 3,600-h.p. 3,000-V. d.c. locomotive near Leon

Further A.C. Electrification in France

Conversion at 25-kV. of S.N.C.F. lines from Dôle to Vallorbe and from Frasne to Pontarlier

Dôle Station, showing 1,500-V. d.c. platform line in foreground and a 25-kV. a.c. line next it

ELECTRIC traction was inaugurated on April 25 from Dôle to Frasne and Vallorbe (62¾ miles), and from Frasne to Pontarlier (10 miles). As reported briefly in our May 16 issue, these conversions have been carried out by the French National Railways on the 25-kV., 50 c/s system, and form a continuation of the 1,500-V. d.c. electrification completed from Dijon to Dôle in December, 1956 (see our December 21, 1956, issue). The Swiss Federal Railways began electric operation of the line from Pontarlier to the frontier at Les Verrières on their own 15-kV., 16 2/3 c/s system at the end of May, 1956.

System "Frontiers"

The changeover between d.c. and a.c. locomotives takes place at Dôle, where the station has three reception lines for each direction of running, on one of which the overhead line can be energised with either form of supply. Locomotives can be changed in 6 min. At Pontarlier only the main running lines and those required for electric locomotive movements have been electrified. Steam and diesel locomotives continue to be used at this station for shunting and for working industrial branches. The two electrification systems are separated in the centre of the station by three "dead" sections of overhead line, each 33 yd. long.

Vallorbe, on the other hand, was already fully electrified on the Swiss system, so that complete renewal of the overhead equipment was necessary at the French end of the station to adapt it for service at 25-kV. New layouts have been adopted for the lines used for locomotive movements and stabling, these being now in two separate groups, one electrified at 25-kV. and the other at 15-kV. There are eight "dead" sections in the overhead system, separating the two voltages, and three zones which are normally energised at 15-kV., but can be switched to 25-kV. to allow S.N.C.F. trains to arrive and depart and have their locomotives attached. Luminous signs showing the figure "25000" inform French drivers when a line has been connected to this supply in order that they may proceed, and special signals warn the drivers of Swiss locomotives against attempting to enter areas where the 25-kV. system is in use.

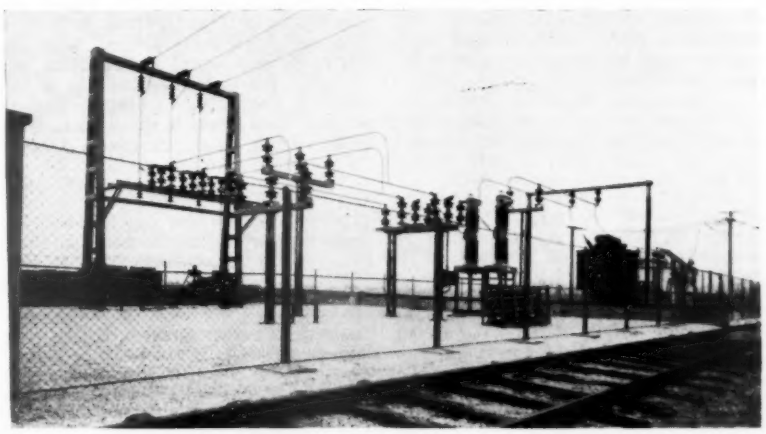
Certain parts of the station are permanently energised at the Swiss voltage and frequency. An S.N.C.F. driver approaching one of these sections must stop and lower the locomotive pantograph, after which a Swiss locomotive hauls the complete train to the desired point and then propels the French locomotive to a position where it has access to the 25-kV. overhead line and can return to depot.

The changeover of voltage is effected by 12 motor-driven isolators controlled from pushbuttons mounted on an illuminated diagram of the tracks concerned. When these tracks are being supplied at 25-kV. they appear in red on the diagram; when isolated from the supply they are illuminated in white; and when under their normal voltage of 15-kV. they are unilluminated. To change voltage, the pushbuttons corresponding to the voltage desired and the section concerned are operated simultaneously, this action causing the switchgear to be operated and the points on adjacent lines fed at the alternative voltage to be locked. Local hand or electric operation of the isolators is possible in case of a fault in the remote control system. The state of the supplies to all tracks is shown on a wall diagram. A supply failure or short-circuit is indicated at once by illumination of the affected area on the diagram, and by the lighting up of notices detailing the action to be taken.

Current for the new electrification is taken from three substations at Brévans, Mesnay, and Mouremboz, all of which are between Dôle and Frasne. The substations are connected to the 63-kV. network of Electricité de France. All the equipment is normally under remote supervisory control from Dijon. Civil engineering work was necessary in the sixteen tunnels on the route, and at the stations at Dôle, Arc-Senans, Mouchard, Andelot, Frasne, and Pontarlier. Long welded rails have been laid on the Dôle-Mouchard, Boujeailles-Vallorbe, and Frasne-Pontarlier sections.

Motive Power and Train Services

Traffic is being worked by 13 ignitron rectifier Bo-Bo locomotives of class "12000," which have taken the place of almost twice that number of steam locomotives used formerly. This design



63/25-kV. transformer substation at Brévans

Double track line near Dôle, showing the beginning of single-track section to Arc-Senans

was introduced for the Lille-Basle electrification and was described in our issues of October 29 and November 26, 1954. The locomotives have a continuous rating of 3,360 h.p., a maximum speed of 74·5 m.p.h. and weigh 85 tonnes. They can haul 750-ton passenger trains from Dôle to Vallorbe (compared with a winter limit in this direction with steam haulage of 685 tons, and a summer load of 750 tons), without double-heading between Mouchard and Frasne. An average acceleration of 20 min. has been effected in the Dôle-Vallorbe direction.

From Vallorbe to Dôle the "12000" class locomotives also work passenger trains of 750 tons, whereas the steam traction limits were 385 tons in winter and 425 tons in summer; and they are able to dispense with double-heading from Vallorbe to Frasne. In this direction the average acceleration is 7 min. Noteworthy increases have also taken place in the weights of goods trains, which have been raised from 1,200 to 1,400 tons between Dôle and Mouchard, and from 400 to 700 tons between Mouchard and Frasne.

Effects on Train Operation

Electrification has greatly improved the working on the Dôle-Vallorbe line, particularly with regard to train loads and to speeds up the long gradients between Mouchard and Frasne. Moreover, by making the loads of the fast and express trains approximately the same as those on the main line between Paris and Dijon, electric traction has enabled the number of relief trains to be reduced appreciably compared with those necessary with steam working, and has similarly cut down the locomotive-mileage required both for the haulage and the double-heading of these relief services.

Double to Single Track

Taking advantage of the conditions mentioned above, the S.N.C.F. decided to reduce to single track the sections between Dôle and Arc-Senans (15·5 miles), and between Mouchard and Frasne (28 miles), except for the very short stretches between Pont-d'Héry and Andelot (3 miles), and between Boujeailles and Frasne (5 miles) on which there are no tunnels. These measures have enabled economies to be realised in electrical equipment, track renewals, and maintenance, while a satisfactory flow of traffic has been maintained by the installation of automatic colour-light signalling specially adapted for single-line working. This is the first signalling of its kind in France, and is characterised by the use of electronic track circuits and directional interlocking.

The latter prevents the signal giving access to a single-track section at one end from being cleared when the corresponding signal at the other end is "off" for a train proceeding in the opposite direction. Outdoor staff at stations have access to small pushbutton panels from which they can describe to the signalbox a route required for shunting movements.

While at present stations have their own signalboxes, a development in view is the provision of remote control from Mouchard of the signalling at all stations from Mouchard to Frasne. A further proposal is the installation at Mouchard of a "programme" machine to control the signalling during certain hours of the day in a similar manner to the system installed recently by London Transport at Kennington (see our January 17 issue). It is intended to use germanium diodes and transistors in all this equipment, instead of ordinary thermionic valves and relays, because of their low power consumption.

Inductive Link

As an experiment, line wires have been erected on the supports of the overhead system by means of which it would be possible to maintain communication with the trains by an inductive link. The ultimate step envisaged is to concentrate the control of signalling for nine stations between Dôle and Vallorbe at Dijon, where the controller would be assisted by a programme machine and would have direct communication with the drivers of trains. The Dôle-Vallorbe line is therefore destined to become an important test length for the further development of railway signalling practice.

International Connections

During the official opening ceremonies of the new electrification on April 25, Monsieur Boyaux, General Manager of the S.N.C.F., said that the journey from Paris to Berne via Pontarlier would be shortened by 24 min. and from Berne to Paris by 42 min. The day timing from Paris to Milan would be reduced by 1 hr. 5 min., accompanied by a cut of 39 min. in the reverse direction. There would be accelerations of 2 hr. and 1 hr. respectively from Paris to Venice and *vice versa*, and of 3 hr. on the Paris-Brindisi journey. The "Simplon-Orient" express has had its schedule from Paris to Milan reduced by 1 hr. 11 min. and from Milan to Paris by 55 min. as from June 1. On the same occasion Monsieur Gschwind, General Manager of the Swiss Federal Railways, looked forward as a result of the new electrification to a day when it might be possible to travel from Paris to Milan in only 8 hr.

CLOSED RAILWAY TO BE CONVERTED TO ROAD.—The Ministry of Transport is reported to have decided to incorporate a section of the Abergavenny-Merthyr Tydfil line of the Western Region into plans for improving the Heads of the Valleys road connecting with the Ross Spur motorway which is being constructed. Only parts of this railway are being abandoned and the tracks recovered—from Abergavenny Brecon Road to the junction with the Blaenavon line at Brynmawr, from the junction of the Abertillery line at Brynmawr to the Brickworks siding at Beaufort, and from Nantybwch junction, near Tredegar, to Morlsis Tunnel junction, two miles north-east of Merthyr Tydfil.

CHANNEL TUNNEL SURVEY BEGINS.—On May 29 engineers began work on a geological survey into the possibility of a Channel Tunnel linking Great Britain with France. As an initial step, they are clearing the shaft and galleries built at Sangatte, near Calais, in 1881. The work is being undertaken by the Channel Tunnel Study Group, in which the Channel Tunnel Co. Ltd. has accepted liability as the British group participant for a 30 per cent share in an initial total expenditure of £100,000. The company itself will provide 12 per cent, and the remaining 18 per cent will come from sub-participants, who have agreed to take an interest in the Study Group under the ægis of the company. The British Transport Commission, as successor to the South Eastern Railway, has the largest individual shareholding in the Channel Tunnel Co. Ltd.

RAILWAY NEWS SECTION

PERSONAL

Mr. W. O. Galletly, Assistant Chief Mechanical Engineer, Victorian Government Railways, has been appointed Chief Mechanical Engineer of that system. He succeeds Mr. C. F. Brown, who, as recorded in our May 16 issue, becomes a Commissioner of the railway. Mr. Galletly is succeeded, as Assistant Chief Mechanical Engineer, by Mr. W. Featonby.

Mr. Robert Arbuthnott

Elected President, Institution of Locomotive Engineers, 1958-59

Mr. G. D. Khandelwal

Appointed Chief Operating Superintendent, Eastern Railway, India

Mr. Robert Arbuthnott, M.B.E., T.D., M.I.C.E., M.I.Mech.E., M.I.Loco.E., who has been elected President of the Institution of Locomotive Engineers for 1958-59, took office on June 1. He was educated at Cheltenham College and served his apprenticeship at the Vulcan Foundry Limited. After practical training in the shops and drawing office, he joined the engineering section of the Glasgow Corporation Gas Department, and became Clerk of Works during the construction of the Dawsholm coke handling plant. During this period he qualified as an Associate Member of the Institution of Civil Engineers. In 1926 he was appointed Assistant Works Manager, Nasmyth Wilson & Co. Ltd. (now the Patricroft Royal Ordnance Factory), and was subsequently Works Manager and Director & General Manager. In 1939 he was embodied in the Territorial Army of which he had been an active member for many years. He served with the Manchester Regiment and later formed a Workshop Company R.E.M.E., which was attached to the 6th (Guards) Tank Brigade for the campaign in N.W. Europe. Mr. Arbuthnott was demobilised in 1945 and, in 1946, joined the North British Locomotive Co. Ltd. as Assistant to the Managing Director. Shortly afterwards he was elected to the board and appointed Joint Managing Director. He relinquished this appointment last year, but remained an executive member of the board. He is also a Director of the Carntyne Steel Castings Co. Ltd. In 1951 he was appointed a Member of the Iron & Steel Consumers Council and in 1956 was deputy leader of the U.K. Heavy Engineering Mission to India. He was elected an Associate Member of the Institution in 1926 and a Member in 1934. He became a Member of Council in 1948 and has been a Vice-President since 1952.

We regret to record the death, on May 28, of Mr. G. A. S. Harvey, President of G. A. Harvey & Co. Ltd.

Mr. G. D. Khandelwal who, as recorded in our May 23 issue, has been appointed Chief Operating Superintendent, Eastern Railway of India, was educated at Allahabad University where he gained double first before joining the former East Indian Railway in 1935. He served as a Claims Officer and was later appointed a Divisional Operating superintendent. He became Acting Deputy Chief Operating Superintendent in 1951. In 1954, he served as Regional Transportation Superintendent, Bilaspur and, the following year joined the Railway Board as Joint Director, Traffic (Transportation). In 1956, Mr. Khandelwal returned to the Eastern Railway as Divisional Superintendent, Asansol. For a short time in 1957, he acted as Chief Operating Superintendent, before being appointed Divisional Superintendent at Dinapore. Mr. Khandelwal relinquishes this position to become the Chief Operating Superintendent.

Mr. A. G. Norman has been appointed General Manager of the Trinidad Government Railways.

In our last week's issue, in listing the nominations for the Officers and Committee Members of the Metropolitan Section of the Institute of Transport, we regret we omitted the Section heading. The nominations were for the Metropolitan Section.

London Transport announces that, following a re-arrangement of work within the Department of the Chief Financial Officer, Mr. A. J. Spong, Principal Accounts Assistant (General), has been appointed Principal Assistant (Financial Investigation). Mr. A. Boorman has been appointed Principal Budgets Assistant, with the rank of Principal Executive Assistant.

Mr. J. M. Read, Senior Budgets Assistant, British Transport Commission, has been appointed an Assistant Director of Accounts, Accounts & Statistics Division.

Mr. Leslie M. Sayers, Assistant General Manager, London Midland Region, British Railways, who, as recorded in our May 30 issue, has been appointed Assistant General Manager (Administration), North Eastern Region, began his railway career in 1927 as clerk at Belper, London Midland & Scottish Railway. He was appointed Stationmaster at Lancaster Castle in 1940, and subsequently held a number of appointments in the Operating Department at Crewe, Watford, Derby and Peterborough, before becoming Assistant District Operating Manager, Leicester, in 1946. In 1948 he became Operating Assistant to the Secretary & Manager, Cheshire Lines Committee, at Liverpool and later was appointed District Operating Superintendent at Liverpool, C.L.C. He took up a similar appointment at Hull in 1950. In August, 1951, he returned to the London Midland Region as District Operating Superintendent, Nottingham. Three years later he became Divisional Operating Superintendent at Crewe, and in January, 1957, was appointed Assistant General Manager, London Midland Region.

Mr. L. M. Sayers

Appointed Assistant General Manager (Administration), North Eastern Region

Mr. M. Srinivasan, who, as recorded in our April 25 issue, has been appointed Joint Secretary in the Ministry of Railways (Railway Board), India, graduated from Bangalore Engineering College and joined the Indian Railway Service of Engineers in 1940. He was an Assistant Executive Engineer on the former East Indian Railway until 1941 when he was appointed Executive Engineer, Surveys & Construction. He subsequently became Executive Engineer, Projects & Design, Construction Department, E.I.R. In 1948 he was appointed Senior Superintendent, Way & Works. During 1947-48, he was visiting Lecturer in railway engineering at the Bengal Engineering College. He was responsible for all engineering arrangements for the Kumbh Fair at Hardwar in 1950 and subsequently in 1954 for a similar fair at Allahabad. During 1948-54, he executed major protection works at Ganges bridges at Gurmukteshwar and Rajghat Narora and was also responsible for planning, design, and execution of various major yard remodelling and construction works. Mr. Srinivasan has been an examiner for Calcutta and Patna Universities. In 1954, he was posted as Civil Engineer with the Indian High Commission, London. In this capacity he established contacts with European railways and the steel and other industries for investigation of various railway problems and acquainted himself with latest developments. He worked on the Indian Fact Finding Mission on Thomas Steel in 1956 and assisted the Indian Railways Steel Purchasing Mission in 1957. Mr. Srinivasan was a delegate from Indian Railways to the International Railway Congress Association Conference at Scheveningen in June, 1956. Until recently, he was posted with the India Supply Mission at Washington to cover supplies of steel and iron from the U.S.A. and Canada for the Second Five-Year Plan of Indian Railways.

Mr. M. Srinivasan

Appointed a Joint Secretary of the Indian Railway Board

Mr. J. D. J. Saner has been appointed Engineer-in-Chief of the Mersey Docks & Harbour Board, in succession to the late Mr. A. B. Porter.

Mr. J. Lohmann, Superintendent of Operation, Netherlands Railways, who, as recorded in our May 23 issue, has joined the board of that system, began his railway service in the Civil Engineering Department in 1930. After holding several appointments, including that of District Engineer, he joined a firm of engineering contractors. He returned to the railway in 1949, as Chief Engineer, New Works, and in 1952, became Chief Civil Engineer. He was appointed Superintendent of Operation in 1954. He is succeeded by Mr. van Bilderbeek, Principal Engineer, Operating Department.

Mr. J. P. Koster, Chief Engineer, Rolling Stock & Electrical Equipment, Netherlands Railways, who, as recorded in our May 23 issue, has been appointed to the board of that system, joined the railway in 1942, after service with electric power undertakings. In 1953, he took charge of rolling-stock and workshops. He became Chief Engineer, Rolling Stock & Electrical Equipment, in 1956. He is succeeded, as Chief Engineer, Rolling Stock & Electrical Equipment, by Dr. J. J. Jonker, Superintendent of Workshops at Tilburg.

Mr. J. L. Greer

Appointed Deputy Chief Civil Engineer, Malayan Railway

Mr. J. P. Cunliffe

Appointed Assistant Chief Engineer (Signals), Malayan Railway

Mr. A. D. Eaton

Appointed Assistant Chief Civil Engineer, Malayan Railway

Mr. J. L. Greer, M.I.C.E., who, as recorded in our March 28 issue, has been appointed Deputy Chief Civil Engineer, Malayan Railway, was born in the Isle of Man in 1907, and was educated at University College, Auckland, New Zealand. In 1922, he joined the Auckland Harbour Board as a cadet, and was later engaged on design and construction of various dock, harbour, and ferry works. He subsequently became Senior Staff Engineer. In 1938 he was appointed Construction Engineer to the General Mining & Agency Co. Ltd. From 1940 to 1945 Mr. Greer served in the Royal Australian Naval Reserve. He was commissioned in 1941 and, for three years, commanded various ships. He returned to Malaya in 1946, to re-join the General Mining & Agency Co. Ltd., as Chief Engineer. In February, 1947, he joined the Malayan Railway as a Civil Engineer, and was appointed District Engineer (Open Lines) six months later. In 1953 Mr. Greer became Senior District Engineer, and later Acting Assistant Chief Engineer, an appointment confirmed in January 1956.

Mr. J. P. Cunliffe, who as recorded in our March 28 issue, has been appointed Assistant Chief Engineer (Signals), Malayan Railway, was born in London in 1917, and was educated at Trent College, Derbyshire. In 1936, he entered the service of the London Midland & Scottish Railway at Crewe, as a Signal & Telegraph Engineering Apprentice. During the 1939-45 war Mr. Cunliffe served in the Army in the United Kingdom and the Middle East, attaining the rank of major, and, from 1943 onwards, was in command of Railway Telegraph Units. After release, he rejoined the L.M.S. at Watford as a Technical Assistant, and, in April, 1946, was transferred to Derby in the same capacity. In 1949, Mr. Cunliffe was appointed Assistant to the Signal & Telecommunications Engineer, Scottish Region. He was appointed Engineer, Signal & Telegraph, Malayan Railway, in 1953.

Mr. A. D. Eaton, who, as recently recorded, has been appointed Assistant Chief Civil Engineer, Malayan Railway, went to Sierra Leone in 1947. There he joined a firm of consulting engineers, investigating improvements to the Sierra Leone Government Railway. He was appointed Assistant Engineer to that railway in 1948. In 1951, he became Engineer, Way & Works, Malayan Railway, and, three years later, was engaged on the evaluation of civil engineering assets in connection with the Renewal Fund of that railway. Mr. Eaton was appointed a District Engineer in 1955 and, from April, 1957, he acted as Divisional Engineer. He was confirmed in that position in the following August.

Mr. John Bowman and Sir George Walton have been appointed Members of the North Eastern Area Board British Transport Commission.

Mr. B. B. Mathur, Senior Deputy General Manager, Northern Railway of India, has been appointed General Manager of that system. He succeeds Mr. K. Kaul who has retired.

Mr. S. S. Ramasubban, Senior Deputy General Manager, Western Railway of India, has been appointed General Manager North Eastern Railway of India. He succeeds Mr. B. Arora, who has retired.

Mr. K. Swarup, Deputy Chief Mechanical Engineer, Integral Coach Factory, Madras, Indian Railways, who has been acting as Chief Administrative Officer of that factory since March 18, has been appointed Chief Mechanical Engineer of those works.

Dr. Llewellyn Douglas, Chief Mechanical Engineer, South African Railways, has been appointed Assistant General Manager (Technical) of that system. He takes up his new appointment on June 23, in succession to Mr. L. C. Grubb who is retiring.

Mr. D. W. Morison, Traffic Manager & Assistant General Manager of Hants & Dorset Motor Services Limited, Bournemouth, has been appointed General Manager of the company, in succession to Mr. G. H. Napthine, who is retiring.

We regret to record the death, on June 1, at the age of 78, of Mr. Everard Kenneth Brown, President of the Railway Club since 1928.

We regret to record the death of Mr. Arthur Bertram Walker, former Secretary, Thos. Cook & Son (Bankers) Limited.

Mr. Harold Clay is to retire from the board of management of British Road Services on June 30.

Mr. A. G. Boardman, Traffic Superintendent, Birmingham Parcels Branch, British Road Services, has been appointed Branch Manager, Birmingham Parcels Branch, in succession to Mr. E. J. Coxhead, who is retiring.

Mr. W. A. G. Hall, Chief Engineer, Potteries Motor Traction Co. Ltd., has been appointed Chief Engineer, Southdown Motor Services Limited, with effect from September 1. He succeeds Mr. H. R. Lane, who is retiring.

We regret to record the death, on May 29, of Mr. C. Cooper, formerly of the Sudan Railways.

Mr. T. P. Strafford has been appointed a director of the Trent Motor Traction Co. Ltd., in place of Mr. George Dow, who has resigned.

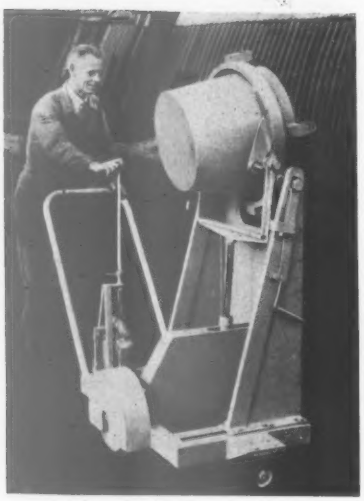
Sir Josiah Eccles is President-Elect of the Association of Supervising Electrical Engineers. He will succeed Sir Harold Bishop.

Sir Archibald Finlayson Forbes has been elected to the board of the English Electric Co. Ltd.

Dr. L. W. Brown has been appointed Assistant Chief Electrical Engineer (Light Current), Metropolitan-Vickers Electrical Co. Ltd., Manchester.

Mr. J. Floweth has been appointed Branch Manager, Nottingham, of British Insulated Callender's Cables Limited. He succeeds Mr. M. H. Healey who has retired.

NEW EQUIPMENT AND PROCESSES



Molten Metal Transfer Ladle

A HYDRAULIC tilting transfer ladle has been developed for transporting molten metal. Applications include, for example, receiving metal from melting furnaces for transferring to bale-out holding furnaces, or die-casting foundries, and so on.

The truck has a single ram and is of light construction to allow of easy movement. The ladle is mounted on a truck fitted with solid rubber-tyred wheels which have roller bearings. It can be operated entirely by one man.

Lifting and tilting is by a double-action pump operating a single hydraulic ram controlled by a pump handle, and lowered by operating the valve control on the pump.

The lifting of the ladle is adjustable to suit various heights of pouring positions of the melting furnaces feeding the ladle. It is available with capacities of 200, 300 and 400 lb., for light alloys and for magnesium alloys, and 150, 250, 400 and 600 lb., for non-ferrous metals.

The cost of labour for transferring metal in the foundry is stated to be greatly reduced by the use of this piece of equipment.

The transfer ladle is manufactured by the Manometer Manufacturing Co. Ltd., Savoy House, 115-116, Strand, London, W.C.2.

Large Mobile Crane

THE Coles Model L.5012 Conqueror mobile diesel-electric crane, recently introduced, is stated to be the largest of its type in Europe.

The crane is capable of a 45-ton lift at 10-ft. radius with a 50-ft. centres strut jib. The heavy duty machine is truck-mounted, and has unlimited full-circle-slewing in either direction, with one-man operation.

The manufacturer's usual form of diesel-electric transmission system in used, consisting of a variable voltage generator which supplies current to the separate motors of the hoist, derrick and slew motions.

The eight-wheel chassis is specially designed and is powered by a six-cylinder Rolls-Royce engine developing 250 b.h.p. Transmission is by a 20-in. fluid coupling through a propeller shaft to a gearbox which has eight forward and two reverse speeds. The speeds are selected by an electro-pneumatic semi-automatic system. Steering is power assisted and brakes are operated by air. An automatic safe load indicator gives audible and visual warning of any tendency to overload the machine. Should the supply of current be interrupted either intentionally or accidentally, automatic electro-mechanical brakes are immediately applied to the crane motions irrespective of any action on the part of the operator. Self-resetting limit switches automatically cut the hoist and derrick motions should attempts be made to exceed the prescribed limits.

The superstructure of the L.5012 revolves on a large diameter ring of double ball bearings which run in hardened races. This obviates the need for a crane centre post and gives an even distribution of loading on the chassis frame.

The cab is situated in a forward position on the revolving superstructure and allows the operator an unrestricted view. With a new system of pilot switch control the operator selects the appropriate switch and governs the speed of motion by pressure on the accelerator pedal.

A 50-ft. strut jib of lattice construction is fitted as standard equipment, but this can be extended to 140 ft. by inserting extension pieces. A total length of 170 ft. can be attained by the use of a 30-ft. fly jib extension.

The Coles L.5012 is manufactured by Steels Engineering Products Limited, Crown Works, Sunderland.

Anti-White Rust Galvanised Steel

A PROCESS to reduce, if not entirely eliminate, the formation of white rust on galvanised steel sheets has been developed; it is being included as part of the manufacturing technique of Galvatite, a galvanised steel sheet product. It is stated not to diminish the brilliance of the sheet surface or reduce the spangle.

In the past, very substantial financial losses have been suffered due to the formation of white rust, during shipment and storage. Its formation appears on the galvanised sheets when they are subjected to unsuitable conditions, especially when rain and changes in temperature cause moisture on the sheets. The chemicals in the small globules of moisture react, destroying the all important uniform zinc protective coating on the steel. This process is claimed to prevent the initial reaction taking place.

Before announcing the development, the manufacturer undertook severe testing; in one test, sample sheets of Galvatite were sent by sea to New Zealand and back. They encountered considerable changes in temperature and weather, but returned to England without any signs of white rust formation. Sheets of ordinary Galvatite without the new treatment which went on the same trip were all greatly affected by the conditions and there was appreciable white rust.

The manufacturer is John Summers & Sons Ltd., Shotton, Chester.

Wiring System for Ceilings

THE Robertson Q-Deck wiring system which, by utilising the cells of Robertson cellular-type roof decks as ducting for cables, makes conduit unnecessary. This is stated to lead to greater economy in the cost of buildings as wiring is speeded up and simplified and also material and labour costs expended on both installation and maintenance can be reduced.

Chasing of plaster and additional conduits are not necessary when new lighting points are required. With the cells of the roof deck at 6-in. centres over the whole of the roof and with every cell acting as a

large capacity conduit, lighting points can be moved, or schemes can be extended, merely by drilling a hole at the position of the new points.

Although with the system separate ducts have to be run on the surface of the ceiling, at right angles to the run of deck in order to carry supply cables to individual cells, these ducts are neat and are necessary only at intervals of about 60 ft. along the roof.

The cells are entered from a cross-over header duct leading to the distribution board and the header duct is the only component of the system which is visible from below. The header ducts have hinged covers for access to the wiring and the complete isolation of different supply systems is ensured by installing separate header ducts which are connected to each distribution point.

Entry to the Q-Deck cells is by a drilled hole, 3-in. diam. and a union is made by means of a grommet. The union allows the cables to pass from the header duct into the Q-Deck cells. Header ducting is supplied in nominal lengths of 4 ft. and is joined by butt straps which are welded to one end of the duct. The butt straps are swaged to eliminate all rough edges and form a smooth bridge over the butt joint of the ducting.

Header ducts are fixed direct to the Q-Deck soffit, approximately at 2-ft. centres, by a double line of self-tapping screws, and end closures are supplied for blanking the dead-end runs. Provision is made for up to 1-in. dia. conduit to be extended from the header duct and from the end closure.

The manufacturer is Robertson Thain Limited, Ellesmere Port, Wirral, Cheshire.

Improved Filter Element

A FILTER element which has improved characteristics over the previous products of the manufacturer has been developed. Known as the Maxivee, the element can be applied to lubricating oil and fuel filters on diesel locomotives and other ancillary equipment.

The element uses, in its construction, the new VAF 66 filter medium; not only does this possess the same efficiency and sludge holding capacity as existing types, but because of the characteristics of the medium, it has other advantages.

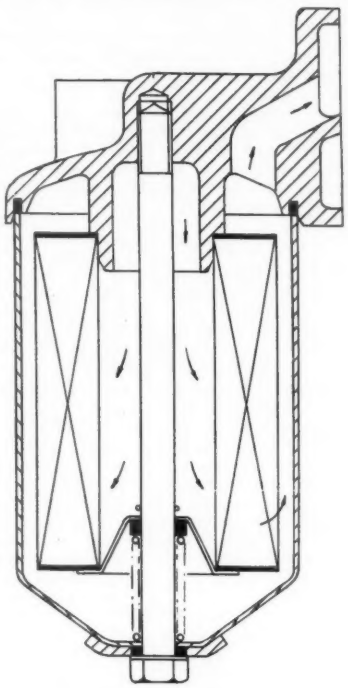
The Maxivee element is formed from an impregnated felt with plastic-sealed end caps; this construction is so rigid that a supporting wire gauze has been omitted. This allows a greater amount of active filtering material to be accommodated in the element as compared with existing types. It is also cheaper to manufacture.

Testing has indicated that a service life of 10,000 miles on average automotive equipment is possible with a full flow filter of modest dimensions. By making no attempt to remove the fine peptised matter in a detergent oil, the whole of the considerable dirt capacity of this element is utilised for collecting harmful matter, and full flow operation is achieved over the whole period, even with cold oil.

Typical capacities and overall lengths of centre-bolt type filters with the new medium, for mobile applications, are: 450 g.p.h., 9¼ in.; 600 g.p.h., 12⅞ in.; 900 g.p.h., 16¼ in.

Size for size with contemporary filter elements containing other filtering media such as paper, the Maxivee element is stated to have almost equal active filtering area but to possess considerably better flow characteristics and sludge-holding capacity. In fact, these two characteristics are so superior that smaller filters than those using other filtering media for the same oil flows are now being produced.

The range of the manufacturer's lubricating oil filters is in process of being redesigned so that full advantage can be taken of this development. The illustration shows a cross-section of a typical flange-fitting filter.



Further details of the Maxivee element may be obtained from the manufacturer, Vokes Limited, Henley Park, Guildford, Surrey.

Improved Tool Steel

A RECENT development of a high-speed steel has been the Mushet Special V.G. This is stated to be a specially balanced tungsten-molybdenum super high-speed steel, containing cobalt for enhanced red-hardness with greatly increased carbon and vanadium contents to employ to maximum effect the great intrinsic hardness of vanadium carbide. The resulting combination of high hardness, red hardness, great abrasion resistance and a good measure of toughness impart, it is claimed, a suitability for all types of cutting operation.

A performance better than that of normal types of high-speed steel is obtained, particularly in cutting the more abrasive materials and those of high work-hardening capacity; tools have a longer life between regrinds and will cut faster. The manufacturer has subjected the material to extensive tests and has obtained performance details on many materials, including high-speed, stainless, carbon and alloy steels, besides Nimonic alloys.

The steel is now available in the form of lathe and planer tools, toolholder bits, and so on, as well as in bars and blanks.

Further details may be obtained from the manufacturer, Samuel Osborn & Co. Ltd., Clyde Steel Works, Sheffield, 3.

Industrial Floor Marking Tape

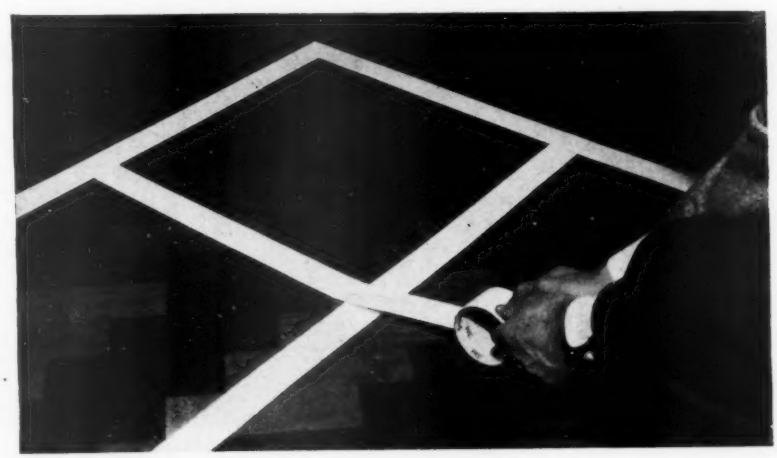
A SELF-ADHESIVE vinyl plastic tape, suitable for marking out lanes, aisles, parking and warning lines on workshop floors and so on is now available, known as Scotch Boy No. 471 Lane Marking Tape.

The tape can be laid to almost any clean dry, hard surface, such as wood or concrete, provided it is not roughly pitted. It is white in colour and is available in widths varying from ½ in. to 4 in. in 36-yd. rolls; 2 in. is the width used most commonly for industrial lane marking.

The No. 471 tape may be laid on a clean floor after it has been dusted or swept; if the surface is oil or grease-stained a preparatory wash with a detergent is recommended. Once laid, the tape offers resistance to oil, water, caustics, acids and most commercial solvents.

The self-adhesive marking tape has been found to have a life of several times that of paint and to have a reduced annual cost of some 40 per cent per unit length. The illustration shows the tape being applied to a wooden floor.

Further details of Scotch Boy No. 471 Lane Marking Tape may be obtained from the manufacturer, Minnesota Mining & Manufacturing Co. Ltd., 3M House, Wigmore Street, London, W.1.



British Timken Limited

Increased turnover and continued expansion: Sir John Pascoe's address

Sir John Pascoe, Chairman & Managing Director of British Timken Limited, at the thirty-eighth annual general meeting of the company held in Birmingham on May 29, said:

The consolidated net profit of British Timken Limited and its wholly owned subsidiaries for the year 1957 after taxation amounted to £872,681 compared with £779,541 for 1956. This net profit was arrived at after charging £520,921 for depreciation, which exceeded last year's provision by £53,074.

The net profit of British Timken Limited, including the profits of our subsidiaries only to the extent of dividends declared, was £802,738, against £709,685 for 1956. With the amount brought forward, we have a disposable balance of £1,040,050 against a balance of £943,896 last year.

We propose to deal with this balance by transferring £435,000 to general reserve, £100,000 to contingency reserve, confirming the payment of the dividend on the 1,000,000 £1 4 per cent cumulative redeemable preference shares, amounting to £23,000 net, confirming the payment of the interim dividend of 5 per cent tax on 3,000,000 £1 ordinary shares which required £86,250, paying a final dividend of 5 per cent less tax on the 4,000,000 ordinary shares of £1 each absorbing £115,000, and carrying forward to the 1958 accounts £281,700.

Capital Expenditure

During the year, capital expenditure amounted to approximately £1,000,000, and, in addition, you will see from the report that at the end of the year, we had outstanding capital commitments of £800,000. By the end of 1958, we shall have incurred capital expenditure over six years of approximately £5,000,000.

This very large amount has been and is being used on extensions and equipment of our various factories, and the expenditure has enable us to increase considerably our total turnover, which, for 1957, was some 16-17 per cent higher than for the previous year, and further to increase our net profits by the modest amount of some £90,000.

Orders and Output

Our sales of bearings for original equipment during 1957 showed an increase in every department, the decline in deliveries to the motor car trade during the first three months being more than made up during the latter part of the year when our deliveries to that trade were at a higher rate than ever before.

The largest percentage increase, rather naturally, was in the sale of our larger bearings manufactured at the Daventry factory on which so much capital has been expended during the past few years. With our increased turnover, the percentage of direct exports was maintained at the same level, and we still estimate that between 40 and 50 per cent of our home sales is for equipment which is eventually sold overseas.

Technological Developments

Technological developments in the bearing industry in methods of manufacture are increasing rapidly, and this in itself, as I have previously stated, necessitates the provision of large amounts of capital year by year.

Last year I reported on our fully mechanised automatic lines, and I would add that the new lines which we are now in process of installing show very considerable development over those already in operation.

Profits Tax

The unfair nature of this tax is well shown by the fact that its simplification is now penalising just those companies which followed the Government's request to maintain a conservative dividend policy. Nevertheless, we welcome its simplification as being a recognition by the Government that the making and distribution of profits are the very foundation of a free enterprise system. It is perhaps possible to hope that the present or a future Government, recognising that on industry depends our economic strength, our standard of living, and indeed, our very existence, may one day decide that economic conditions alone call for the abolition of profits tax entirely.

Our turnover and profits for the first four months of the current year compare favourably with the same period of last year. There are, however, plentiful signs that a recession is approaching, if not already here, as is shown by a reduction, although at present small, in orders received in almost every department with the exception of that which supplies the passenger motor car manufacturers, whose present brilliant performances have meant a greatly increased demand for the types of bearings they use.

Fischer Bearings Co. Ltd.

The turnover and profit figures of our main subsidiary, Fischer Bearings Co. Ltd. for 1957 were very similar to the corresponding figures for 1956. Although the turnover in our special bearings supplied to the aircraft and associated industries was appreciably higher, this market is at the present time in a state of some uncertainty owing to the transitional stage through which the aircraft industry is passing.

Workers and Staff

On your behalf, I would like to express thanks to all our staff and workpeople at home and abroad for the support they have so ably given to us during the past year.

The report was adopted.

Network Analyser Installed at G.E.C. Witton Works

Equipment to work in conjunction with digital and transient computers

Claimed to be the first full-size network analyser of the transformer analogue type, the WINA has been built and installed at the Witton Works of the General Electric Co. Ltd. This analyser, in conjunction with the digital and transient computers already installed, can deal with the full range of problems likely to be encountered in the electrical industry. One of the first investigations to be carried out is an analysis of the maximum traffic load which can be carried on an electric railway in Greece.

With the many accurate units available, it is possible to set up quickly a detailed track section and represent the trains at their various points by the requisite negative current injection unit. This is more convenient than simulating the motors by an equivalent impedance, as it makes continuous adjustment for voltage regulation unnecessary.

After the circuit has been set up with the required train loadings at any instant, the current distribution on the track and between various feeding substations can be metered. This allows the following to be readily investigated: (a) effect of different track couplings; (b) rating and fault current through the track breakers; (c) correct setting for protective equipment; (d) effect of load sharing with various substations out of action; (e) effect of different types of substation; and (f) effect of the coupling of the various substations to the Electricity Supply network.

Besides an operational analysis such as

Network analyser control room, showing equipment racks and console

the above, motor design and control gear problems, both electrical and mechanical, can be investigated.

WINA differs in principle from earlier large commercial analysers in that it operates on the transformer analogue principle, as distinct from the conventional miniature component type of model network assembly. Before embarking on this project, the G.E.C. made a careful study of the relative merits of all types, and decided that a network analyser operating on the transformer analogue principle was needed.

This unit can cover a far wider range of problems than the conventional analyser, since for many intricate system and machine design problems, the conventional unit is not readily capable of simulating the required type of physical component. Also, the transformer type has a much higher inherent accuracy.

Unit Construction

The new unit is built in four individual sections; each section consists of a central plug-board with 52 standard analyser units arranged in racks on either side. The units in each section are connected to the plug-board by jumper leads, to permit any desired arrangement of connections. Front sockets also are provided for additional interconnections. The control desk, arranged in two sections, accommodates all control facilities, recording instruments, and metering arrangements. The lay-out has been schemed to provide the operator with a clear view of the complete analyser, and with all continuous controls and meters within easy reach.

Each half of the desk has an illuminated plotting table, with a small square corresponding to each socket of the plug-board. Plotting sheets which fit over the plotting table enable the readings of the illuminated squares to be directly recorded in the correct positions on the sheets.

The complete unit was designed and built at Witton and the wiring carried out by the G.E.C. Telephone Works, Coventry.

First Repair Shop Built for Vacuum-Braked Wagons

Work has started at Chester, British Railways, London Midland Region, on the first wagon shop to have special facilities for the maintenance of the vacuum brakes with which an increasing number of freight wagons are being fitted.

The shop is to be sited in the coal yard near Chester General which will avoid the use of the level crossing necessary in the old shop. Adequate shop and siding facilities will be provided for dealing with all the work of wagon repair, including the turning of wheels, the necessity for which is expected as a result of the more intensive use to which wagons will be put.

There will be full facilities for the periodic examination and overhaul of the continuous vacuum brake mechanism on 75 wagons weekly, and also for the scraping and painting of all-steel and steel-frame wagons which has to be done five-yearly to maintain them in good order.

The old shop could not deal with all the crippled wagons arising locally, and some had to be sent away; the new shop will be able to handle all local work and will have capacity to assist other shops in certain types of work. All types of wagon repairs will be possible except heavy repairs which will have to be done in one of the main works. The new shop is expected to carry out weekly 92 light repairs and steel wagon repairs, 25 brake overhauls only. In addition re-conditioning of 250 brake cylinders and associated equipment will be undertaken partly for the wagons in the shops and partly for other wagon shops at Holyhead, Crewe, and Garston (Liverpool).

The staff at the new shop will be about 60, compared with the 19 in the existing shop.

Among the new plant and equipment will be a combined wheel and journal lathe, various portable tools, automatic vacuum brake overhaul and testing equipment, an overhead crane and gantry, a 25-ton wagon traverser, an air compressor, exhauster, capstans, hoists, and air and vacuum mains.

L.M.R. Bridge over North-South Motorway

Work is to start shortly on a bridge to carry the double track railway and a 15-ft. wide road over a new motorway at Carnforth Brow, Lancashire. The bridge is being built by British Railways, London Midland Region. Situated a mile east of Carnforth, it is to be constructed for the Ministry of Transport to carry the Carnforth - Wennington line over the Lancaster by-pass section of the North-South motorway.

Superstructure

The bridge will have a 73-ft. square span across the roadway. It has been designed with a steel superstructure consisting of three main girders of welded construction. The centres of the main girders are at 28 ft. 6 in. for the railway and at 17 ft. for the accompanying road. Cross girders under the railway are broad flange beams made up into welded compounds, and those under the road bridge are rolled steel joists. The deck will be of continuous reinforced concrete slabs cast *in situ*. The crossing of the motorway is at an angle of about 60 deg., so that although the square span across the motorway is 73 ft., the bridge girders rest on bearings 85 ft. apart. The bearings at one end are of the rocker type. The substructure will comprise vertical abutments and battered wing walls of conventional design constructed of concrete with brick facing.

Method of Erection

The bridge will be erected before construction of the motorway; the final job will be excavation of the earth between the abutments down to motorway level.

Initially the tracks will be supported on temporary way beams to enable the abutments and wing walls of the new bridge to be constructed in trenches lined with steel sheet piling.

The girder work will be assembled alongside the railway on rolling-in runways. The completed and waterproofed bridge unit will then be rolled into position and jacked down on its bearings. This will be done during a weekend so as to minimise interference with train services. The motorway will then be excavated beneath the bridge.

The bridge has been designed under the direction of Mr. J. Taylor Thompson, Chief Civil Engineer of the London Midland Region. The steelwork contractors are Booth & Sons (Bolton) Ltd., and the general contractors Sir Lindsay Parkinson & Co. Ltd.

Presentation to Mr. F. A. Pope

On May 29, Mr. F. A. Pope, who recently retired as a part-time Member of the British Transport Commission, was entertained to dinner at the Great Western Royal Hotel, Paddington, by the six General Managers of British Railways. The illustration shows Mr. H. A. Short, Chairman of the General Managers' Conference, presenting Mr. Pope with an inscribed silver inkstand as a memento of his long and happy association with the General Managers. Sir John Elliot, who specially asked to be associated with the presentation, was unable to attend because of a prior engagement.

Presentation to Mr. F. A. Pope by the General Managers of the Regions of British Railways: (left to right) Messrs. J. Ness (Scottish); David Blee (London Midland); K. W. C. Grand (Western); F. A. Pope, H. A. Short (North Eastern); C. P. Hopkins (Southern) and H. C. Johnson (Eastern)

Staff and Labour Matters

London busmen's wage claim

An emergency meeting of the T.U.C. General Council was called on May 29 to discuss the latest developments in the London bus strike. These threatened an extension of the strike to petrol distribution workers and there was a possibility that power stations might be involved. The Council decided to appeal to the Minister of Labour & National Service with a view to the resumption of negotiations between the Transport & General Workers Union and the London Transport Executive, but the Minister could see no way in which he could usefully intervene. Thereupon, a request was made for a deputation of the T.U.C. led by the Chairman of the Council to see the Prime Minister. The Prime Minister agreed to see the deputation and the meeting took place on May 30. In the talks, which lasted two hours, the Prime Minister was accompanied by the Minister of Transport.

In the meantime, Mr. Cousins, General Secretary of the T. & G.W. Union, discussed the strike with the London busmen's Negotiating Committee and with officers of the road haulage and power workers' section of the union. The Government ordered troops to stand by to man petrol tankers if the drivers of those vehicles joined the strike.

The steps taken by the T.U.C. resulted in the resumption of talks between the T. & G.W. Union negotiating committee and London Transport Executive on May 31. These continued on Sunday, June 1. The talks failed to bring to an end the strike, which has now entered its fifth week, and the parties were unable to find a basis for reaching agreement. The following statement was made by London Transport on June 2 following the breakdown in the talks.

"The negotiations on Saturday and Sunday took place on the basis of the suggestions made by the Prime Minister to the T.U.C. for a settlement of the strike and the meeting was requested by the Union against that background. These suggestions were:—

(a) Payment of an increase of 8s. 6d. a week to the central road services operating staff;

(b) an additional payment to drivers of Green Line single-deck coaches to be made at the same time;

(c) to fix a definite date with London Transport for the review of wages of the staff included in the claim to whom the award of the Industrial Court did not give an increase.

"As to sub-paragraph (a), this is the amount awarded by the Industrial Court which the Executive have throughout been willing to apply.

"An offer on the lines of sub-paragraph (b) was made by the Executive on May 23.

On May 23 the Executive offered to begin a review of the "excluded staff" in the summer.

"Last Saturday they advanced this date to any date in the first week in July; later they proposed that it should begin on the day that work is resumed; without commitment as to the result of the review.

"This was rejected by the union, who proposed that an increase should be paid to these staff now pending the review—and an immediate interim or token payment of 4s. a week was suggested.

"This the Executive were unable to accept because it is the point at issue on which the strike has taken place.

"When yesterday afternoon it was clear that no agreement was possible on the basis of the Prime Minister's suggestions, the Executive made a further offer—to refer the question of the pay of the excluded staff back to Sir John Forster (Chairman of the Industrial Court which made the award) for further review having regard to the time which has elapsed since the hearing before the Industrial Court in February.

"This offer was not taken up by the union.

"It will be seen, therefore, that in an endeavour to facilitate a settlement the Executive have moved a considerable way since before the strike started, when they offered a review of Green Line wages at 'an early date', and of the wages of the remaining staff 'in the autumn'.

"The Executive believe that short of abandoning, under duress of a strike, the principle that arbitration awards are accepted, the proposals they have made offer a fair and reasonable basis for settlement."

Following a report by Mr. Frank Cousins to the Sub-Committee of the T.U.C. General Council on the week-end negotiations, the T.U.C. sought a further meeting with the Prime Minister. The Prime Minister did not feel that a further meeting would serve any useful purpose and this reply was conveyed in the following terms in a statement issued from 10, Downing Street:—

"The Prime Minister said that while he would, of course, be glad to see representatives of the T.U.C. on any matters, he must point out that on Friday last he had given the Government's view on the question of the London bus strike, and he would not be able to add anything to what he then said.

"All he could do would be to repeat what he had said on Friday, and he hoped that the dispute could be settled in accordance with the plan he then outlined. The Prime Minister therefore did not think that a further meeting today could serve any useful purpose."

On receipt of this statement the T.U.C. announced that a special meeting of its General Council would be held on June 4.

Early on June 4 Sir John Elliot reiterated his proposals and expressed willingness to re-open discussions. Mr. Cousins declined to comment on this.

Following the meeting with the Prime Minister the T.U.C. representatives reported back to a special meeting of the General Council in the afternoon.

The Executive of the T.G.W.U., which is in continuous session, and a delegate conference of the London busmen were expected to discuss on June 5 the decision of the T.U.C. general council.

Railway Shopmen

It was announced on May 23 that, as from May 27, overtime would cease to be worked at the Swindon workshops of the B.T.C. This was stated to be an economy measure to provide funds to meet the higher wage bill.

Union Leader Urges Wage Restraint

At Torquay on June 2, Mr. Jack Cooper, Chairman of the annual conference of the General & Municipal Workers' Union, called on the whole trade union movement "to look for modest increases in real wages instead of demanding substantial concessions which, if realised, can only aggravate our economic difficulties."

Although he criticised the policies of the present Government, he said that the unions should avoid a head-on clash: this would only lead to "industrial suicide." No thinking trade unionist could ignore the fact that the two main political parties called for restraint on wage claims as a contribution towards ending inflation.

Mr. Cooper added that the only real prospect for improvement in workers' living standards was through greater industrial productivity. He believed that, with a properly-organised economy, Britain could afford an annual wage increase based on an increase in productivity, under normal conditions, of at least 3 per cent.

He had earlier stated that it seemed the trade unions could only retain the present methods of industrial bargaining if they used their freedom "in a responsible manner." They must show that, while pursuing the legitimate claims of their members, they accepted their obligation to put the interests of the nation as a whole before any sectional interest. They had done this during the war and immediately afterwards, notably in the economic crisis of 1948-50.

"The Conservative Government regards wage increases as one factor contributing towards inflation. The Labour Opposition takes a similar view. Of course they differ fundamentally on methods and policies for dealing with the problem as a whole, but no thinking trade unionist can ignore the fact that the two main political parties call for restraint on wage claims as a contribution towards the ending of inflation. . . . Have we gone far enough in playing our part towards solving the problem?"

Economy in Danger

Mr. Cooper stated that, during 1947-58, wage rates had increased by 76 per cent while retail prices had risen by 69 per cent. An increase in real wages of about 4 per cent had been achieved. This rise, attained by pushing up nominal wages, had greatly increased prices, which were a constant danger to our economy, and, particularly, to our export markets. An average yearly increase of 3 per cent in production since the war gave a considerable margin for wage increases without the need of equivalent price increases. Because of this, he believed the country could afford an annual wage increase of at least 3 per cent.

The unions knew that the Government was dealing with inflation by restricting output and creating some unemployment—methods which the unions opposed. Nevertheless, Mr. Cooper believed the unions were not justified in seeking a head-on-clash with the Government or in committing industrial suicide.

A decision by the unions to restrain wage demands would provide a positive contribution which the T.U.C. could take to any Government as a real gesture of co-operation in solving the problem of inflation, and it might well influence Government policy.

Mr. Cooper prefaced his speech, which was received in silence, with the statement "I am attempting to point a way out" (of the problem of inflation) "as I see it. I know we cannot do this as an individual union . . . what I propose is practicable if it is accepted by the trade union movement as a whole. I also fully understand that other claimants on the national product must make their contribution: but none of these difficulties and complexities justifies our movement burying its head in sand."

Contracts and Tenders

Main-line diesel-hydraulic locomotives for Sierra Leone

Hudswell, Clarke & Co. Ltd. has received an order from the Sierra Leone Government Railway for a further eight main-line diesel-hydraulic locomotives. This addition brings the number of locomotives the company is building for the railway up to 16, and the total value is some £500,000. The locomotives are being fitted with a Paxman Hi-Dyne diesel engine, with a Vulcan Sinclair dual fluidrive transmission unit. This type of locomotive has been developed over the past four years under the name of "Enterprise," and is known as the "Enterprise" series, according to the power ranges required.

Australian Iron & Steel Limited, Port Kembla, New South Wales, has placed a contract with the English Electric Company of Australia for four 900-h.p. diesel-electric locomotives. They will be built at the company's Rocklea works in Queensland. The locomotives will be similar to the 880-h.p. diesel-electric units delivered to A.I. & S. Limited in 1950.

The National Development Bank of Brazil has placed an order, on behalf of the Port Administration of Rio de Janeiro, with the International General Electric Company, New York, for 15 45-ton and two 65-ton diesel-electric locomotives. The ports of Porto Alegre, Itajai, Laguna, Imbituba, and Paranagua will each receive two 45-ton G-E locomotives. Fortaleza, Natal, Recife, Maceio, and Sao Francisco do Sul will receive one each. The two 65-ton units will be used in the port of Rio de Janeiro.

British Railways, North Eastern Region, has placed the following contracts:—

T. E. Cundy & Son Ltd., Leicester: cleaning and painting, Leeds and Newcastle branch, Stockton North Shore branch, and part of Hartburn Curve

Stewart Maggs Limited, Doncaster: electric lighting, Hull English Street goods warehouse

Henry Berry & Co. Ltd., Hunslet, Leeds, 10: hydraulic combined spring stripping and buckling press, York Wagon Works

Ridghouse Limited, Darlington: supply and erection of steel-framed buildings, Hull Springhead Wagon Works.

British Railways, Southern Region, has placed the following contracts:—

N. G. Bailey & Co. Ltd., Leeds, 4: installation of electric light and power, Eastleigh Carriage & Wagon Works

Fredk. Braby & Co. Ltd., London, N.W.1: installation of ventilation, Waterloo Arches

Chas. Griffiths, Barking, Essex: demolition works, Walworth Road Coal Depot

C. & T. Painters Limited, London, N.W.10: cleaning, tarring and painting, Kew River Bridge

Aubrey Watson Limited, New Malden, Surrey: repositioning platform and roofing, Redhill

C. Jenner & Son Ltd., Folkestone, Kent: construction of carriage cleaning stages, Dover Priory

P. & M. Contractors Limited, London, S.W.1: station renovations, Penshurst, and Dover Marine

Holloway Brothers (London) Limited, London, S.W.1: erection of multiple unit light lifting shed, extensions to carriage cleaning shed, and ancillary works, Ramsgate

Mears Bros. (Contractors) Ltd., London, S.E.26: reconstruction of Woolwich New Road and General Gordon Place Bridges, Woolwich Arsenal, and Five Waterings, Sewer Bridge, Appledore.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From South Africa:

3,000 bogie open drop-side steel wagons, type DZ-7, 3-ft. 6-in. gauge

1,000 four-wheel open drop-side steel wagons, type ES-7, 3-ft. 6-in. gauge

750 bogie coal hopper wagons, type A-11, 3-ft. 6-in. gauge

22 bogie sideless steel wagons, type 8-ZNR, 3-ft. 6-in. gauge

8 bogie sideless steel wagons, type S-17, 3-ft. 6-in. gauge

Sarcast bogies; sarcast bogie components; wheels and axles; automatic couplers; vacuum brake cylinders; friction bolster snubbers; drawgear, friction and solid types; and oil bath pivot centres.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. B.7185: Types DZ-7, ES-7, A-11, 8-ZNR and S-17 Wagons and Components," should be addressed to the Chairman of the Tender Board, P.O. Box 7784, Johannesburg. The closing date is August 8, 1958. Local representation is essential. The Board of Trade reference is ESB/13538/58.

From Australia:

75 welded hopper wagon bodies, class VJM.

The issuing authority is the Queensland Government Railways. The address to which bids should be sent is the Secretary, Commissioner for Railways, Adelaide Street, Brisbane. The closing date is June 26, 1958. The Board of Trade reference is ESB/13395/58.

From India:

1,133,290 tie bars MS, MG for CST track sleepers as per I.R.S. drawing No. T-433 alt. nil and to I.R.S. specification No. T-8-50.

The issuing authority is the Director General of Supplies & Disposals. The tender No. is WPI/RC-115/II. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is June 19, 1958. Local representation is essential. The Board of Trade reference is ESB/13716/58.

6,429,100 split cotters, M.S. for C.I. sleepers to I.R.S. drg. No. T-401 alt. 3

2,039,290 split cotters, M.S. for CST9 sleepers BG & MG side split type to I.R.S. drg. No. T.432 alt. nil

2,574,000 bent plate cotters, M.S. for C.I. sleepers to I.R.S. drawing No. T.424 alt. nil.

The issuing authority is the Director General of Supplies & Disposals. The tender No. is WP-1/RC-114/11. Bids should be sent to the Director General of Supplies & Disposals, Shahjahan Road, New Delhi. The closing date is June 17, 1958. Local representation is essential. The Board of Trade reference is ESB/13715/58.

From Iran:

100 sets of points, complete, of heavy U33 rail, with radius of 300 m. (50 right-hand and 50 left-hand)

150 sets of points, radius 190 m. (75 right-hand and 75 left-hand).

The issuing authority and address to which bids should be sent is the Iranian State Railways, Procurement Department, Tehran. A deposit of $30,000 is required. The closing date is June 15, 1958. The Board of Trade reference is ESB/13861/58.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobalds Road, W.C.1).

U.S.A. PASSENGER SERVICE ECONOMIES.—The Chicago, Rock Island & Pacific Railroad is planning shortly, as the New York Central has done already, to take over the working of its Pullman parlour, restaurant, and sleeping car services from the Pullman Company, as an economy measure. The Rock Island has made such substantial progress recently in passenger service economies that it has cut its annual loss to $727,000, and by further measures now in view expects to reduce the loss to less than $250,000 annually. Few of its long-distance passenger trains are now losing money.

NEW RANGE OF LISTER AIR-COOLED DIESEL ENGINES.—R. A. Lister & Co. Ltd. held an exhibition of its new range of air-cooled diesel engines at Park Lane House, London, W.1, on June 2. The already established 3½ and 7-h.p. range has been enlarged by the addition of the 4½, 8½, and 12¼-h.p. engines. These new engines bridge the gap between the smaller power units and the new range of 20 and 30-h.p. engines. These latter engines are available as two and three-cylinder models. This series is a direct development of the present smaller air-cooled diesel engines of 3½ and 7 h.p.

CAR/SLEEPER SERVICE BETWEEN MIDLANDS AND SCOTLAND.—A twice-weekly car/sleeper service was introduced on June 3 between Sutton Coldfield, British Railways, London Midland Region, and Stirling, Scottish Region. From Sutton Coldfield, departure is at 9.35 p.m. Sundays and Wednesdays until August 31, with arrival at Stirling at 6.40 a.m. South bound the train leaves Stirling on Tuesdays and Fridays at 12.15 a.m. and arrive at Sutton Coldfield at 9.30 a.m. the same morning, until September 1. The return fare between Sutton Coldfield and Stirling, covering car and driver, is £14 10s., with an addition of £5 for each extra passenger or £3 for each child aged 3-14 years. Each passenger is provided with a seat in a table-fitted compartment and a sleeping berth equipped with pillow and rug. By arrangement, a packed supper can be supplied on departure from Sutton Coldfield and breakfast at the Station Hotel, Stirling, also supper at Stirling and breakfast on arrival at Sutton Coldfield.

Notes and News

B.I.C.C. Limited New Birmingham Offices Opened.—British Insulated Callender's Cables Limited new Birmingham store and sales office was opened at 67-77, Holloway Head, Birmingham, 1, on June 2. The telephone No. is Midland 6922.

Woman Sucked out of Train.—A woman is reported to have been "sucked," last week, through the door of a Southern Region multiple-unit electric train from Hastings to Victoria. She was found on the line near Gloucester Road Junction, Croydon, suffering from minor injuries.

G.N.R.(I.) Summer Timetable.—The Great Northern Railway Board summer passenger timetable came into operation last Monday. The morning express from Belfast to Dublin now leaves at 8.15 instead of 8.20 a.m., and the 11.40 a.m. express from Belfast to Dublin leaves at 12 noon. On the Portadown to Londonderry line the 9.20 a.m. from Belfast is altered to 8.25 a.m. The timetables include details of connecting bus services for the Armagh and Enniskillen directions, where the train services were withdrawn last autumn.

Presentation of Western Region First Aid Awards.—Mr. K. W. C. Grand, General Manager, British Railways, Western Region, recently presented nine certificates, with a gift, to members of the Western Region staff in recognition of exceptionally meritorious first aid rendered. He was supported by Messrs. M. G. R. Smith, Chief Civil Engineer; S. G. Ward, Regional Establishment & Staff Officer; H. G. Bowles, Assistant General Manager (Administration); J. W. J. Webb, Regional Accountant; E. Flaxman, Commercial Officer; C. J. Rider, Public Relations & Publicity Officer; W. W. Wood, Chief of Police; Dr. W. D. Anderson, Medical Officer; and Mr. J. A. Martin, Regional Ambulance Secretary. An additional special award for an exceptional case in which personal courage was shown and efficient first aid rendered was made to Police Constable E. Graham, Banbury. A vote of thanks to Mr. Grand was proposed by Mr. C. Dean, one of the recipients. The accompanying illustration shows Mr. Grand with Mr. Ward and Mr. Martin sitting on his right and left respectively, and eight recipients (one was unable to be present).

Glasgow Suburban Electrification Progress.—The laying of foundations for the overhead wiring system for the Glasgow suburban electrification of British Railways, Scottish Region, is being continued this week, when work has been carried out between Dalreoch and Craigendoran, on the Helensburgh line.

Heavy Bookings by London-Scotland Car/Sleeper Trains.—Extensive demands for reservations in the Marylebone-Glasgow car/sleeper service is reported by British Railways, London Midland Region. The trains leave Marylebone on Tuesdays, Thursdays, and Saturdays, and accommodate 20 cars in covered vans and 84 passengers in sleeping berths.

Southern Region Electric Locomotive Damaged by Fire.—A British Railways, Southern Region, third-rail Co-Co electric locomotive was damaged by fire caused by an electrical fault, on June 1. The locomotive was hauling a freight train from Horsham to Norwood Yard when the outbreak occurred. A steam locomotive from Redhill hauled the train into a siding and the fire was brought under control. The electric locomotive later resumed operation under its own power. Up trains were slightly delayed.

New Booking Office for Euston Electric Line Platforms.—A new booking office for passengers by electric suburban trains, with glass on two sides, has been brought into service at Euston, London Midland Region. Tickets issue is by a Westinghouse Garrard Minor Multiprinter. The provision of this new suburban booking office marks the first stage in modernisation and mechanisation of all booking offices at Euston. Ten more of these machines, but of a larger type, are to be installed. Besides the new booking office an improved messroom and covered accommodation for the ticket collectors is being provided.

Mr. K. W. C. Grand with Mr. S. G. Ward and Mr. J. A. Martin and members of Western Region staff who received awards for meritorious first aid

Associated Electrical Industries Limited Interim Dividend.—An unchanged interim ordinary dividend of 2½ per cent has been declared by Associated Electrical Industries Limited in respect of the year ending December 31, 1958.

British Waterways Yacht Centre at St. Pancras.—British Waterways are to provide a yacht centre for cruising vessels at St. Pancras. A basin with access to the Grand Union Canal there is to be developed to give permanent mooring facilities for people using the canals and inland waterways for pleasure boating.

Improvements at Bushey & Oxhey.—Work has been completed on improvements to Bushey & Oxhey Station, London Midland Region. There are now two new waiting shelters, with toilets, on the main-line platforms. They are built in prefabricated timber and have replaced two temporary open-fronted structures.

"Transport Treasures" Exhibition at York.—The British Transport Commission "Transport Treasures" mobile train, on exhibition in the Old Station Yard, York, on May 15-27, attracted a total of 12,660 visitors. The biggest daily attendance was on Whit Monday, when 3,000 people viewed the Royal coaches and other exhibits.

Netherlands Railways Permanent Way Association Meeting in Folkestone.—The Netherlands Railways Weg en Werken (Permanent Way) Association held its annual conference at Folkestone earlier this week. Some 350 delegates travelled from and back to Flushing by special steamer. Visits included the coastal erosion works at Folkestone Warren (described in our issue of May 21, 1954). A reception was given on Tuesday to the Mayor of Folkestone.

Maiden Voyage of m.v. "Bolton Abbey."—The British Railways, North Eastern Region, m.v. *Bolton Abbey*, which was launched last December at the Lowestoft Yard of Brooke Marine Limited, made her maiden voyage from Hull to Rotterdam last Wednesday. During the remainder of 1958 the ship will sail weekly between these two ports, leaving Hull on Wednesdays and Rotterdam on Saturdays. She had taken the place of the s.s. *Bury* which was withdrawn from service at the beginning of June.

New Ferry Ship for Lymington/Yarmouth Route.—An order has been placed by the British Transport Commission with the Ailsa Shipbuilding Co. Ltd., Troon, Ayrshire, for a double-ended passenger and vehicle ferry for the Lymington/Yarmouth route of the Isle of Wight services operated by the Southern Region of British Railways. The new vessel is expected to be ready for service in the autumn of 1959; it will replace the 31-year-old paddle steamer *Freshwater*. Accommodation will be provided for 620 passengers and 26 motor vehicles of up to 30 tons weight. There will be three enclosed lounges and a buffet. Provision will be made for conveying mails and baggage, also cattle in portable stalls. Overall length will be 164 ft. and extreme breadth of 42 ft. 6 in. Total deadweight capacity will be 90 tons. Two Voith-Schneider propellers will be fitted—one at each end, arranged diagon-

ally opposite. Each will be directly driven by a Crossley EGN8-type diesel engine which, when developing 320 b.h.p. at about 600 r.p.m., will give a speed of 10½ knots.

British Timken at the Brussels Exhibition.—Many types of bearings are being displayed by British Timken Limited at the International Exhibition at Brussels, varying from a four-row rolling mill tapered roller bearing weighing 3½ tons, down to miniature bearings. The display is depicted in the accompanying illustration. It shows a wide range of products used in all forms of transport and industry. Included on the stand are railway wagon bearing units and axle and cannon boxes. A feature displayed on the stand is miniature bearings produced by Fischer Bearings Co. Ltd., a subsidiary of British Timken Limited. The smallest miniature bearing manufactured by Fischer Bearings Co. Ltd. weighs approximately 1/1000th of an ounce, whilst the largest bearing made by British Timken Limited weighs over 4½ tons.

Roller bearings and other British Timken products exhibited at the Brussels Exhibition

Thornaby Motive Power Depot Opened.—Mr. Harold Watkinson, the Minister of Transport & Civil Aviation, opened the new motive power depot at Thornaby, British Railways, North Eastern Region, yesterday. He later inspected the depot, accompanied by Mr. T. H. Summerson, Chairman, and other Members of the North Eastern Area Board; Mr. H. A. Short, General Manager, North Eastern Region; other railway officers; and guests. The new depot is the largest single project to be completed so far in the North Eastern Region under the British Railways modernisation plan, and cost some £1,250,000.

British Railways Punctuality Awards.—The accompanying illustration shows Sir Brian Robertson, Chairman of the British Transport Commission, presenting to Mr. H. A. Short, General Manager of the North Eastern Region of British Railways, the shield won by the Region in the freight train punctuality improvement competition for 1957. The corresponding trophy for improvement in passenger train punctuality was won by the London Midland Region and presented by Sir Brian Robertson to Mr. David Blee, General Manager of the Region.

Sir Brian Robertson presenting to Mr. H. A. Short the shield won by the North Eastern Region for improvement in freight train punctuality

Blaw Knox Dividend Maintained.—Despite a reduced trading profit of £292,362 for 1957 compared with £389,097 for 1956, Blaw Knox Limited is maintaining the same net distribution as last year. The final payment of the ordinary dividend is 20 per cent which forms a full dividend for the year of 30 per cent. The general level of demand for construction machinery throughout the industry reached a peak in 1955. The downward pressure apparent in 1956 continued throughout 1957. £50,000 has been transferred from the unappropriated profit account to the general revenue reserve account, leaving a balance of £275,280 in the unappropriated profit account to be carried forward to 1958.

U.I.C. Committee Meetings in Budapest.—Meetings of the six permanent and the *ad hoc* committees of the International Union of Railways (U.I.C.) are being held in Budapest at the invitation of the Hungarian Government and Hungarian State Railways, between June 5 and 19. The representatives of the British Transport Commission and of British Railways attending the several meetings are:—

Messrs. H. J. Bourn, Continental Superintendent, Southern Region; K. Brinsmead, Assistant Civil Engineer (Permanent Way), B.R. Central Staff; J. A. Broughall, Electrical Engineer (Development), B.R. Central Staff; F. W. Burton, Regional Accountant, Southern Region; S. A. Claydon, Continental Traffic & Shipping Manager, Eastern Region; E. S. Cox, Mechanical Engineer (Development), B.R. Central Staff; J. W. Eling-Smith, Chief Draughtsman, C. & W. Department, L.M. Region; T. R. Hawkes, Regional Accountant, N.E. Region; H. R. Hewitt, attached to U.I.C. Liaison Office, B.T.C.; S. S. Hirst, Assistant Freight Officer, B.R. Central Staff; J. W. Innes, Chief Technical Assistant, C. & W. Department, Swindon, Western Region;

Messrs. J. W. Kennedy, Assistant to U.I.C. Liaison Officer, B.T.C.; R. H. Kitching, General Assistant to Continental Traffic & Shipping Manager, Eastern Region; G. M. Leach, International Traffic Officer, B.T.C.; W. J. Nigh, Passenger Assistant to Continental Superintendent, Southern Region; A. Potts, Regional Accountant's Office, Southern Region; C. E. R. Sherrington, Director, Research Information Division, B.T.C.; W. J. A. Sykes, Chief Mechanical & Electrical Engineer, Southern Region; J. F. H. Tyler, Assistant Signal Engineering Officer, B.R. Central Staff; and E. J. Vipond, Operating Officer, B.R. Central Staff.

Armstrong Whitworth (Metal Industries) Limited Results.—For the financial year of 1957, Armstrong Whitworth (Metal Industries) Limited is maintaining the total ordinary dividend at 10 per cent with a final payment of 7½ per cent. Group net profits amounted to £219,206 compared with £184,445 for the previous year, after

tax of £232,413 (£158,766). Consent of the Capital Issues Committee has been obtained for an issue of fully-paid ordinary shares to ordinary shareholders on a two-for-five basis.

Rolls-Royce Limited Results for 1957.—A final dividend, less income tax, of 15 per cent has been recommended by the directors of Rolls-Royce Limited on the financial year of 1957 payable on July 22, as for last year. An interim dividend of 5 per cent was paid last December. The profit before taxation was £5,370,334 (£5,330,543); after tax, £2,320,334 (£2,130,543). £1,194,089 (£1,267,109) has been retained; and a provision of prior years no longer required is £100,000 (nil).

Penygraig Branch to Close.—British Railways, Western Region, is to withdraw the passenger service between Llantrisant and Penygraig (Glam) from June 9. Coed Ely and Penygraig stations will be entirely closed, but Tonyrefail will remain open to deal with parcels addressed "to be called for." Road services operate in the area.

Fewer Extra Trains for the Derby.—British Railways, Southern Region, ran fewer extra trains than usual to Tattenham Corner and Epsom Downs Stations for the Derby last Wednesday despite the London bus strike. There were only 13 extra trains to Tattenham Corner, and three to Epsom Downs compared with 15 and four last year. Trains were poorly loaded last year, and it was considered that the same number would not be necessary for this year's event.

Closing of Teign Valley Branch.—All services on the Teign Valley branch between Exeter and Heathfield will be withdrawn on June 9. The following intermediate stations and halts to be closed are: Alphington Halt, Ide Halt, Longdown, Dunsford Halt, and Chudleigh Knighton Halt. Certain parcels traffic will continue to be dealt with at Christow, Ashton, Trusham, and Chudleigh. The area is served by bus services. The branch from Newton Abbot to Heathfield, Bovey and Moretonhampstead will continue in operation.

Damages for Injuries to Platelayer.—The family of a platelayer who was killed by a train at Cart Junction, near Glasgow, Scottish Region, in 1955, was recently awarded damages totalling £1,960 by the Edinburgh Court of Session. He had been on frost duty, and had been instructed by the signalman to inspect frozen points and then give a hand signal to a stationary train to proceed. A few minutes later the signalman himself signalled the train to proceed, and it started to move. The platelayer jumped on to the up line and was struck by another train. It was claimed that the accident was caused by the fault of the signalman, who was well aware that the train on the up line was due to pass shortly. For the British Transport Commission, which denied liability, it was stated the accident had been caused by the fault of the platelayer; he should have observed the rules, and should have approached the stationary train by walking along the path parallel with the down line.

Final Closure of G.N.R.(I.) Stations.—As a consequence of the closure, last September, of the Drogheda - Oldcastle, Dundalk - Clones, Clones - Monaghan, and Clones - Cavan branch lines for passenger working in the Republic of Ireland, notice of the closure of nine stations on these branches of the Great Northern Railway has now been given. From June 2, the stations concerned have been finally closed; traffic is being dealt with by lorry services from selected railhead stations.

British Standard for Terminal Markings for Electrical Machinery and Apparatus.—Owing to the wide range of terminal markings covered by the 1938 edition of B.S. 822 and with the intention of including further terminal markings in a revision of the standard, the British Standards Institution is issuing the new edition of B.S. 822 in a series of parts which will be designed to fit into a binder. Part one of the revision is now available and gives terminal markings for instrument transformers and protective transformers as specified in B.S. 81 and B.S. 2046 respectively. The principle of marking is dealt with and diagrams are included as examples. Copies of this standard may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1. Price 4s. 6d.

Forthcoming Meetings

June 6 (*Fri.*).—The Railway Club, at Royal Scottish Corporation, Fetter Lane, London, E.C.4, at 7 p.m. Paper on "The Hastings direct line," by Mr. D. Cullum.

June 7 (*Sat.*).—The Railway Club. Tour of lines in the West Midlands with special train of goods brake-vans over branch to Shipston-on-Stour.

June 7 (*Sat.*) to June 12 (*Thu.*).—Permanent Way Institution Summer Convention at Weston-super-Mare.

June 14 (*Sat.*).—Permanent Way Institution, Leeds & Bradford Section. Visit to Hull Docks.

June 14 (*Sat.*).—Permanent Way Institution, East Anglia Section, at Ipswich. Film "Teeth of steel," introduced by Mr. A. Stokes.

July 17 (*Thu.*).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Talk on "L.N.E. cavalcade," by R. A. H. Weight.

Railway Stock Market

Stock markets have been firmer in response to the better international news, particularly from France. On the other hand, earlier this week sentiment was affected by fears that an early end to the London bus strike is unlikely. The City, however, is still talking hopefully of a further reduction in the bank rate to 5 per cent before long, and the view seems to be growing that the business recession in the U.S.A. has been checked. There is remarkably little selling in markets: it appears that large and small investors alike have decided to follow a waiting attitude.

Foreign rails were very quiet with quotations scarcely tested by business. Costa Rica ordinary stock remained at 17 and the first debentures were 72½. Chilean Northern debentures were 38 and Guayaquil & Quito assented stock was again quoted at 76½. United of Havana second income stock was 6½ and San Paulo Railway 3s. units were dealt in around 2s. 1½d. Mexican Central "A" bearer debentures were 65 and Brazil Railway bonds 5¼. International of Central America shares and preferred stock were $20½ and $123 respectively. Elsewhere, there was a slightly better tendency in Antofagasta ordinary stock, which was 12½, compared with 12¼ a week ago; the preference stock also improved from 27 to 27½.

As usual, Canadian Pacifics moved with the trend of Wall Street and were $48¼, compared with $49¼ a week ago; the 4 per cent debentures were 65xd and the 4 per cent preference stock 54¼. White Pass changed hands around $13¾. Peru Transport shares were $⅝ at which there is a yield of nearly 20 per cent. In other directions, Nyasaland Railways shares held steady at 11s. 3d. with the 3½ per cent debentures 58½xd.

Among shares of locomotive builders and allied concerns, Beyer Peacock 5s. units kept at 8s. 4½d. and Charles Roberts 5s. shares at 7s. 6d.xd. Westinghouse Brake strengthened from 38s. 6d. to 39s. giving a yield of little more than 5 per cent, which reflects hopes of prospects of a higher dividend than last year's 10 per cent. Wagon Repairs 5s. shares kept at 11s. 4½d. and Gloucester Wagon 10s. shares have moved up to 15s., compared with 14s. 9d. a week ago. Birmingham Wagon shares kept at 16s. 6d. but North British Locomotive receded from 12s. to 11s. 7½d. G. D. Peters have eased from 23s. 6d. to 23s. 1½d.

Pressed Steel 5s. shares have eased from 15s. 1½d. to 14s. 10½d. and Dowty Equipment were down from 32s. 6d. to 31s. 9d. despite the official denial of recent new issue talk in the City. Associated Electrical eased from 48s. 9d. a week ago to 48s. awaiting news of the big new debenture issue, expected shortly. English Electric were 51s. 9d., compared with 52s. 6d. a week ago and General Electric 30s. 3d. compared with 30s. 9d. Crompton Parkinson 5s. shares strengthened to 9s. 6d. following the interim dividend announcement. Demand continued for Birmid Industries which have risen afresh to 65s. 6d., a gain of 2s. 6d. compared with a week ago. British Aluminium have been helped by attention drawn to increasing uses of aluminium, and have risen further from 38s. 6d. to 41s. 3d. British Oxygen were 34s. 6d.

In other directions, B.I. Cables at 43s.xd. held steady, helped by the chairman's annual statement, which was regarded in the City as indicating that no fresh capital will be required for the present. British Timken shares changed hands around 49s. 9d. and Alfred Herbert at 32s. 6d. were within 6d. of the level a week ago, and F. Perkins remained at 10s. 1½d. Mather & Platt were 56s. 9d. Vickers eased to 30s. and Cammell Laird 5s. shares to 7s. 9d. but Tube Investments have been firmer at 55s. 6d. and G. & J. Weir 5s. shares held steady at 14s. Ransomes & Marles 5s. shares changed hands around 10s. 7½d.

OFFICIAL NOTICES

FOR SALE. NEW REINFORCEMENT STEEL BARS BSS. 785. Approximately 120 tons ½ in. dia. Approximately 120 tons ⅞ in. dia. Approximately 120 tons ¾ in. dia. Approximately 120 tons ⅞ in. dia. All in 40-ft. lengths. Slightly Stock Rusty condition. Price to Clear—min. 50-ton lots, £30 per ton. Ex site Midlands. Min. 10-ton lots, £33 per ton. Ex site Midlands. THIS OFFER CANNOT BE REPEATED. Your urgent attention would be appreciated.—E. L. Pitt & Co., Ltd., Coronation Works, Perry Barr, Birmingham. Telephone: Bir. 5081 (5 lines).

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